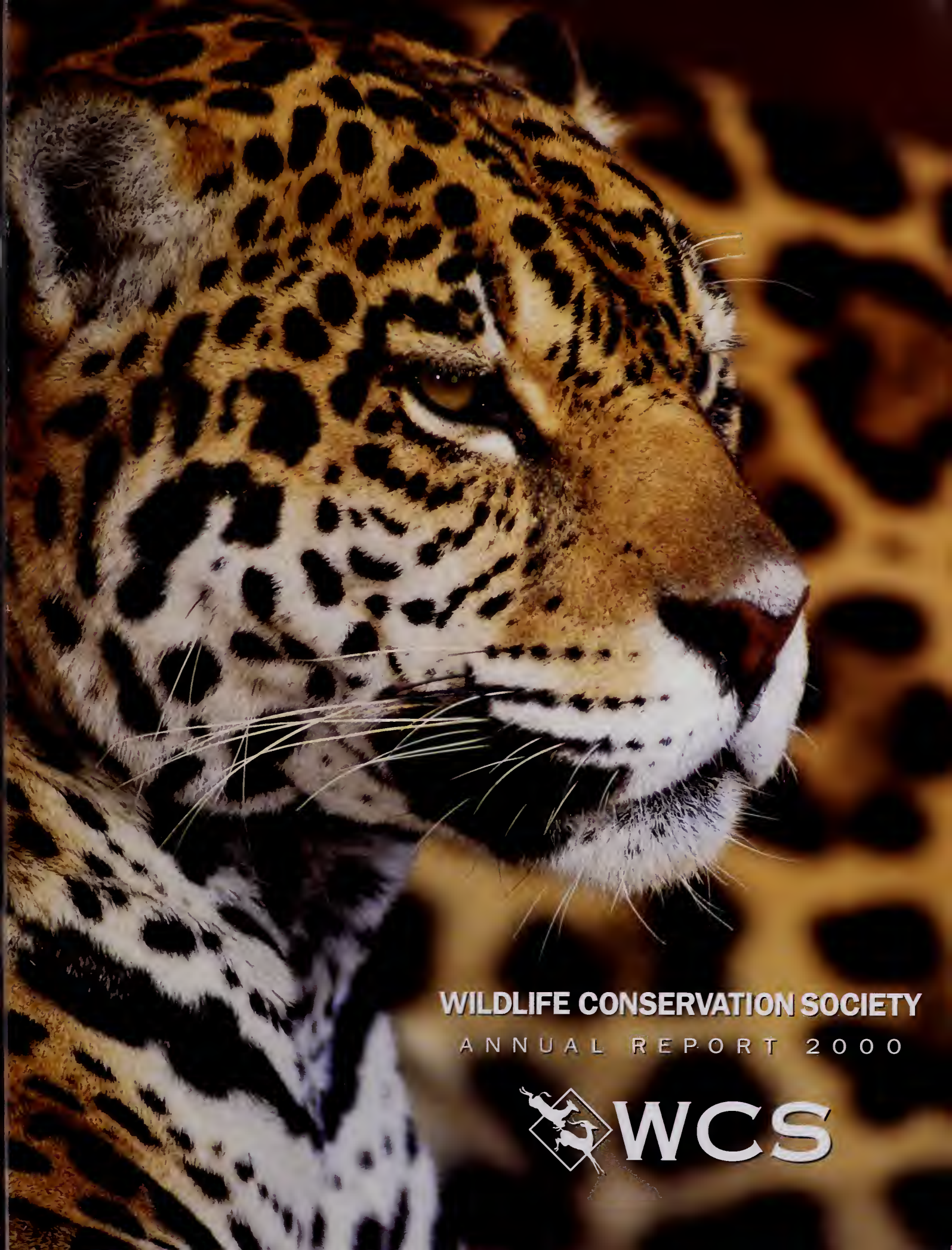




WILDLIFE CONSERVATION SOCIETY

ANNUAL REPORT 2000



WCS

Living **WILDLIFE**

The Wildlife Conservation Society is dedicated to saving wildlife and wildlands, to assure a future for elephants, tigers, sharks, macaws, and countless other species before they are lost forever. That mission is achieved through a conservation program that manages and protects some 50 living landscapes around the world, through the nation's largest system of living institutions—the Bronx Zoo, the New York Aquarium, the Wildlife Centers in Central Park, Queens, and Prospect Park, and the Wildlife Survival Center on St. Catherines Island, Georgia—as well as through pioneering environmental education programs that reach more than three million people in the New York metropolitan area as well as in all 50 United States and in 14 other countries. We are working to make future generations inheritors, not just survivors.







Left: In Argentina, Field Vet Marcela Uhart helped assess elephant seal health on the Patagonian coast. Opposite: Rockhopper penguins on the Jason Islands. WCS is exploring a program there to expand our scientific influence in the southwestern Atlantic.

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The Covers

◆ WCS has established a critical conservation program for the jaguar—a classic landscape species—throughout its range from the southwestern United States to northern Argentina. This program, supported by Jaguar Cars North America, includes a monitoring project in Cockscomb Basin Wildlife Sanctuary, in Belize, where Queens Animal Curator Scott Silver sets a camera trap to photograph these secretive cats.

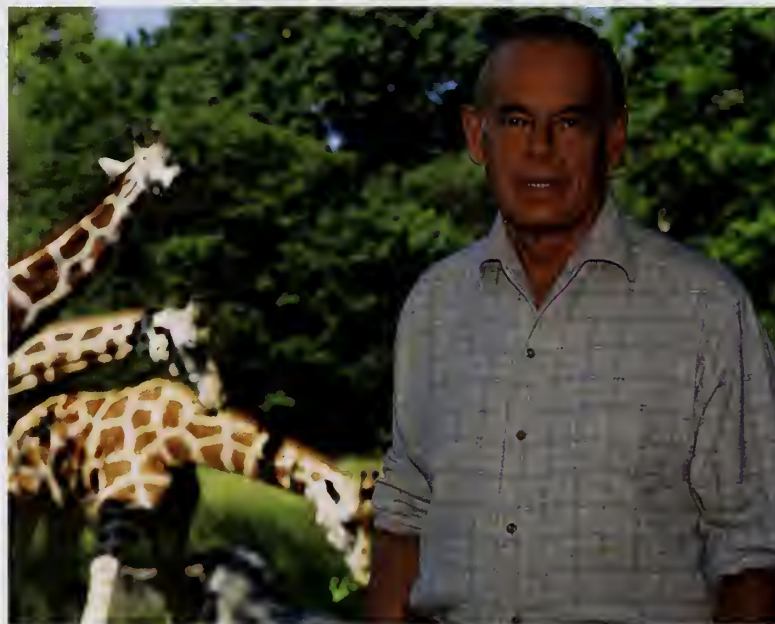


OUR WORLD IS IN DANGER. Our species, for the sake of all Earth's species, must do more than just welcome in the twenty-first century. We must meaningfully and intelligently shape this new age by thinking outside the box, by finding innovative solutions, and, most important, by embracing a new fundamental attitude: We must realize that the natural world of wild animals and wild landscapes is not a commodity; it is an integral part of the human community.

From New York to Nigeria, from Tonga to Tibet, WCS initiatives and programs are, more than ever, erasing the assumed boundary between "our" world and "their" natural world. We have but one world, shared by humans, fauna, and flora. We all depend on clean air and clean water and the healthy habitats that nurture them. When our needs differ—when it becomes a question of ecosystem or energy, environment or economics—we must discover new ways to work in concert with, rather than contrary to, our surroundings. If we simply choose between our needs and those of other creatures, we shall all lose, and the twentieth-century cycle of dwindling habitats, vanishing species, and compromised environments will prevail.

Effective conservation supersedes the need to choose between people and wildlife. In sharing the past year in the life of WCS, this Annual Report provides an exhilarating preview of effective conservation in the twenty-first century. No other organization brings such an integrated, full-court press to the fight for preservation of our living planet.

Animals do not follow maps, so WCS follows wildlife beyond the borders of re-



DAVID T. SCHIFF
Chairman of the Board of Trustees

serves, nations, and even continents. On the East African plains, we are discovering how farmers can raise lambs alongside lions. In the Yellowstone ecosystem, we help cattle ranchers coexist with wolves. We work with colleagues in Russia to create international corridors for tigers. In one of the boldest moves of the new millennium, WCS has launched plans for The Ecological Corridor of the Americas—a greenway along the mountain backbone of the Americas, from Alaska to Argentina, connecting increasingly isolated wild habitats.

We are meeting challenges with solutions that work for wildlife *and* for people. In Nicaragua and Papua New Guinea, WCS supports shade-grown coffee enterprises that preserve trees while producing crops. Our Pacific fisheries program has yielded an artificial bait that attracts certain fish and may substantially reduce by-catch in commercial fishing. In Central African forests, WCS's logging control program has been hailed by the World Bank as a conservation model

that prevents wholesale destruction of habitat. In Africa, Latin America, and Asia, WCS works with communities to reduce commercial hunting of wild animals for meat.

Our efforts to lay a solid foundation for conservation are made possible by the support of countless individuals: the more than four million visitors to our zoos and aquarium, members and patrons, government officials, and colleagues in conservation, science, and education around the world.

WCS's field work is based on a unique living land- and seascape approach to saving wildlife and wild habitats. In 50 vital ecosystems, we address the needs of key landscape animals—from elephants to eagles, from sharks to jaguars—and the needs of humans who share their ranges. The John D. and Catherine T. MacArthur Foundation provided significant support for our South American landscape initiative to expand projects in the tropical Andes, and in Africa, for strategic planning in Nyungwe Forest, despite Rwanda's civil conflict. The Robert W. Wilson Foundation continued its generous support of landscape programs in Asia, Africa, and Latin America—including a last refuge for Sumatran

tigers and rhinos. The Christensen Fund provided key support to our Papua New Guinea program, and funds to investigate the tanoaks die-off in California.

Large carnivores define the vast landscapes over which they hunt. Mr. and Mrs. J. Michael Cline remained generous friends to big cats and other carnivores from North America to Asia by supporting our Global Carnivore Program and other efforts, and through capital support for Tiger Kingdom, planned for 2002 at the Bronx Zoo. Mr. and Mrs. Gary Fink and Save the Tiger Fund, a joint project of The National Fish and Wildlife Foundation, and Exxon Mobil Corporation, helped WCS protect tigers throughout their Asian range. It is fitting that Jaguar Cars North America provided significant support for our Save the Jaguar program, which seeks to protect habitat and travel corridors from northern Argentina to the southwestern United States.

Edith and John Newberry, The Liz Claiborne-Art Ortenberg Foundation, and The Walt Disney Company Foundation remain steadfast in support of a remarkable array of projects worldwide, helping an equally remarkable array of species from bats to right whales to grizzlies.

Other vital international programs received support from Eleanor Briggs, the John and Marsha Goldman Fund, National Geographic Society, and The Saddle Foundation. Our field veterinarian program, in which WCS vets make house calls on wildlife, benefited from the generosity of Dr. Judith Sulzberger and The New York Community Trust.

WCS's work in North America received superlative support from The Ford Foundation for community-based conservation initiatives in the Adirondacks, and from The Charles Engelhard Foundation for wildlife studies in the Grand Tetons. The Doris Duke Charitable Foundation and the Surdna Foundation again helped efforts throughout the tri-state region by supporting our Metropolitan Conservation Alliance.

WCS's commitment to seascapes was matched by The David and Lucile Packard Foundation's commitment to our fisheries and coral reef programs. Through the generosity of the Stavros S. Niarchos Foundation, the Constantine S. Niarchos Conservation Fellowship Program fostered WCS scientist Beth Babcock's research on sharks,



swordfish, and blue fin tuna. WCS Director of Fishery Programs and Senior Research Scientist Ellen Pikitch received continued support through The Pew Charitable Trust.

The City of New York and The Lila Acheson Wallace Fund for the New York Zoological Society continued to provide extraordinary general support. The conservation and education mission of Congo Gorilla Forest was supported by Mr. and Mrs. Rand V. Araskog, The George F. Baker Trust, Mr. and Mrs. Edgar M. Cullman, Mr. and Mrs. Charles A. Dana, The Tina and William E. Flaherty Family Foundation, The Horace W. Goldsmith Foundation, Jack and Susan Rudin, Denise R. Sobel and Norman K. Keller, Mr. and Mrs. Michael Steinhardt, and the Eugene V. and Clare E. Thaw Charitable Trust.

The Congo exhibit and our international programs benefited from the outstanding generosity of Joan O. L. Tweedy. Another longtime friend, Laurance S. Rockefeller, provided remarkable support for capital projects. Mr. and Mrs. J. Michael Cline receive thanks, again, for their support of new technology services at our Bronx Zoo headquarters. Paul A. Gould, Enid A. Haupt, Howard Phipps, Jr., and Anne Sidamon-Eristoff, and the estate of Jack Howard all provided significant support.

Our education programs—from teacher training in New York City to environmental education in China—were furthered by The Picower Foundation, The Starr Foundation, and Toyota USA Foundation. The Sally and Julius Smolen Foundation provided support for Wildlife Health Sciences. Our work with rare species at the Wildlife Survival Center on St. Catherines Island,

Georgia, was again made possible by the Edward John Noble Foundation. And on the island of Manhattan, the Tisch Children's Zoo at Central Park Wildlife Center received continued support from The Families of Laurence A. and Preston R. Tisch.

Many members of the WCS family give their time. Volunteers at our living institutions help enormously, and special occasions demand months of planning by dedicated friends. This year's Gala at the Bronx Zoo, co-chaired by Mr. and Mrs. Charles A. Dana, Jr., Mr. and Mrs. William E. Flaherty, and Mrs. Carroll Petrie honored Lewis and Jack Rudin for their contribution to animals and education programs at the Bronx Zoo, and Dr. William Conway for his distinguished WCS leadership. Gala Journal Chair and new Trustee Elyssa Kellerman contributed to the evening's huge success.

Also elected to the Board of Trustees: Jonathan L. Cohen, Newton L. Gingrich, Judith Hamilton, David R. Jones, Michael J. Kowalski, Walter C. Sedgwick, Daniel K. Thorne, Ward W. Woods, Jr., and E. Lisk Wyckoff, Jr. Frank Y. Larkin was elected a Life Trustee. Roscoe C. Brown, C. Sims Farr, Eben W. Pyne, John T. Sargent, and Dr. Judith Sulzberger were elected Honorary Trustees. Harry Bettis, C. Diane Christensen, Derek Johnson Craighead, Israel Klabin, Jack Stephenson, Patrick J. Thomas, Terence Hastings Thorn, and Dan Vollum were welcomed to the Board of Advisors.

These individuals, and the entire WCS family, fuel our efforts with a passion for wildlife and a commitment to conservation that form the foundation for our compelling work in the twenty-first century.

THE WILDLIFE CONSERVATION SOCIETY has tucked another successful year under its belt. Our accomplishments, detailed in this annual report, are many, and clearly reflect how much the work of WCS means to the wild animals and wild places we are committed to protect.

As a WCS Trustee, I have had access to information on our accomplishments and finances for a long time. However, since becoming Acting President in March, I have gained

a much more personal sense of what our organization is and what WCS trustees, advisors, contributors, staff, and friends are achieving. We report here, for example, that 4.5 million people visited our four New York City zoos and the aquarium during the year. That is true, but to understand what these visits really mean, one must walk, as I now do, around our living institutions during visitor hours. Our guests are people who have put aside the cares and demands of their worlds and, at least for a while, lose themselves and their families in the joy and wonder of our beautiful parks and the wildlife and naturalistic habitats we create and set before them. When one sees the pleasure in their faces, one truly understands why we undertake our role as a community resource with such fervor.

We also report that millions of schoolchildren and teachers attended the education programs taught at our living institutions and in all 50 states. In addition, WCS has helped teach conservation to educators and others in 14 other countries around the world. Here again, the statistics are impressive, but in order to get a true sense of



JAMES G. LARGE
Acting President

what we are achieving one must watch the faces of young visitors in our classrooms, in front of our animal exhibits, or as they watch "Saving Africa's Forest" in the Congo Gorilla Forest's C.V. Starr Conservation Theater. This stunning film reveals the wonders of gorillas in the wild and the terrifying threats to their world. It has a powerful effect on audiences, and as children and their families leave the theater, one can see their determination to do something, anything, to save these marvelous mammals and the natural world. Visitors to

Congo Gorilla Forest are already making a difference by voting their Conservation Choices to allocate their exhibit admission fees to help WCS work with local African peoples to manage their forests sustainably and to establish Lopé National Park in Gabon—a living African landscape and home to such spectacular landscape species as mandrills and red river hogs.

In this report, we also list the statistics for the lands that WCS has helped protect, the

parks managed, and the research carried out in more than 50 living landscapes around the world. These are exciting figures, and in their way they tell the extraordinary story of what we are doing to assure a future for wildlife and wild places. The numbers really come alive, however, when one gazes at the seemingly endless savannas in East Africa, drifts silently down an Amazon tributary, or has a similar experience in any of the many landscapes in which we work. Thanks to WCS, these scenes will, with vigi-

lance, always be wild. To see these places, as I have, is to know why we pursue our mission with such passion.

Originally, I was drawn to WCS because of the wild animals. I will stay and help for as long as I can because of the people. We have our acknowledged heroes, men and women who circle the globe doing science, protecting and managing living landscapes and the wildlife that depend on these wild places. We have others who are equally well known for their abilities to create magnificent wildlife exhibits and to manage our living institutions. These are places that are now arks for endangered and rare species, the platforms from which much conserva-



tion is done, the foundation for our education efforts, and, of course, resources for the community. This much I knew before taking on this position. What I did not fully appreciate until now is the importance of the people who work here. We are a team—union and non-union, senior management and newest hire. That team—almost 2,500 strong—has a sense of the mission that informs all of what we do and makes us the extraordinary organization we are. One can only stand in awe of and have the deepest sense of gratitude for the efforts.

Add to that the truly extraordinary support provided by our committed and caring Board of Trustees and the wonderful support and dedication of our members and donors, and one begins to understand who we really are and, as important, how much more we can become.

By definition, the time of an Acting

CITY SUPPORT

WCS IS GRATEFUL to the City of New York, which provides significant operating funds through the Department of Cultural Affairs and the Department of Parks and Recreation. We thank Mayor Rudolph Giuliani, City Council Speaker Peter Vallone, Bronx Borough President Fernando Ferrer, Brooklyn Borough President Howard Golden, and members of the New York City Council for their support of capital projects. The elected officials of the City of New York are vital to the public/private partnership on which WCS's service to the people of New York rests.

President must come to an end. When I give up my highly prized designation as a "member of the staff" and revert once again to being "merely" a Trustee, I will carry with me a new appreciation of our mission and our accomplishments. The he-

roes who are WCS are fighting the critical battle to save the world's wildlife and wild places and, in the process, save our human selves. For me, it has been the best of times, and because of them, I will never be quite the same.



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Opposite, top and bottom: Trustees and Advisors of the Wildlife Conservation Society. Above: A Wolf's guenon and her new baby, which was born in the Bronx Zoo's new Congo Gorilla Forest exhibit.

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Living **INSTITUTIONS**

WCS brings the wonders of wild animals and the challenges of conserving wild landscapes to nearly five million people each year through its zoos and aquarium in New York City.



BUILDING UPON THE SUCCESS of the Bronx Zoo's new Congo Gorilla Forest and meeting the challenges of the new millennium, the five WCS New York City-based living institutions launched compelling plans for new exhibits for the 4.5 million people that pass through our gates each year. The goals are to educate and involve our visitors in WCS's efforts to save living landscapes, to build constituencies that understand, care about, and take action to save critical wild species and wild places,

and to create world-class zoological and aquarium institutions.

The Bronx Zoo's Congo Gorilla Forest enjoyed a spectacularly successful first year, thanks to the generosity of the major donors listed in the Chairman's Letter as well as Bristol-Myers Squibb Company, the Chase Manhattan Foundation, Dr. and Mrs. Henry C. Frick II, Mr. and Mrs. Brian Heidtke, the JJJ Charitable Trust, Elyssa Kellerman, The New York Times Company Foundation, the Park Foundation, and The Thorne Foundation. In this naturalistic African rain forest, WCS's living institutions connect visitors in New York with our living landscapes program. The ground-breaking complex received the 2000 Exhibit Award of the American Zoo and Aquarium Association (AZA).

Opposite: They may look like Wookies, but these are pygmy marmosets in Congo Gorilla Forest, the smallest New World primates and an effective contrast to the gorillas—largest of the Old World primates and the stars of this spectacular new Bronx Zoo exhibit. Above: In the new WCS operant conditioning program, Wild Animal Keeper Gina Savastano rewards common marmosets when they sit on a scale for their weekly weigh-in.

A new master plan to enhance the exhibition, care, and breeding of landscape species and to address guest, revenue-generating, and infrastructure needs was created and is under review to establish priorities and funding strategies. Bronx Zoo Director of Operations Mitchel Greene was appointed to head construction oversight at the living institutions to provide consistency, better opportunities for exchange of ideas, and more efficient operations.

In addition, planning began for "The Year of the Visitor," in 2001. This initiative will monitor guest needs and effect changes where necessary—from animal exhibits to park operations.

At the same time, institution directors established a program in animal behavior and environmental enrichment, which is chaired by New York Aquarium Director Louis Garibaldi. This exciting new undertaking will provide greater enrichment training for animal husbandry personnel, create a workbook for enriching the lives of WCS wildlife, and provide a format for the exchange of scientific information through seminars by invited scientists in the fields of enrichment and animal behavior. This program will place WCS in a leadership role in the field of animal enrichment.

To celebrate the 100th birthday of the Bronx Zoo, a number of WCS Trustees, Advisors, and staff traveled to Ecuador and the Galápagos Islands. The trip raised funds for the WCS Species Survival Fund and was an enjoyable experience for all.

Richard Lattis, in addition to his duties as WCS Living Institutions Senior Vice President and General Director, served as President of AZA. Among the more significant achievements during his tenure were adoption by the AZA Board of a new Accession and Deaccession Policy, creation of an Animal Welfare Committee, production of the first guidelines for elephant management, and initiation of the development of long-range planning for zoos and aquariums.



OUR LIVING INSTITUTIONS WORK WITH BREEDING PROGRAMS AT HOME AND WORLDWIDE

Bronx Zoo

Mammalogy

The first year of the Congo Gorilla Forest was successful, challenging, and productive. The birth of a female mandrill early on was followed by those of a male Wolf's monkey, twin pygmy marmosets, and a female DeBrazza's monkey. The DeBrazza's infant shares her forest habitat with the mandrills

and the red river hogs. It didn't take long for the DeBrazza's to discover that the young mandrill is a good playmate.

In addition, DeBrazza's monkeys were introduced into the habitat of Timmy's group. At first the gorillas were not sure what to make of the new residents, but the younger gorillas quickly began to playfully chase, and be chased by, the monkeys.

James Doherty, General Curator and Carter Chair of Mammalogy, organized plans for the new Tiger Kingdom, scheduled for 2002. The exhibit will showcase Siberian tigers year-round and will focus on our enrichment and operant condition programs as well as on WCS's leadership role in tiger conservation in Asia.

Several years ago, the department began an operant conditioning program to more safely manage and to behaviorally enrich the Asian elephants. The voluntary contact program for elephants was expanded to include a number of other species. With our large New World monkey collection—19 species—operant conditioning focused on training the monkeys to sit on scales to provide weekly weights on these small, fragile species. In JungleWorld, keeper staff trained the female Matschie's tree kangaroo to allow them to check her pouch for confirmation of pregnancy and to follow development of the young. In Congo, keepers trained female okapi Kveli to cooperate with veterinary staff performing ultrasound pregnancy examinations.

Among the many notable births were twin babirusa, a snow leopard, a Matschie's tree kangaroo, two barasingha, an Asian small-clawed otter, three silvered langurs, and four squirrel monkeys.

Senior Keeper Florence Klecha received WCS Species Survival Fund and American Association of Zookeepers grants to develop a hormone profile of pregnancy in gelada baboons. Supervisor Michael Lensch and Wild Animal Keeper Nichole Morabito became the North American studbook keepers for the Mongolian wild horse and the silvered langur. Wild Animal Keeper Elizabeth Meehan formed a behavioral enrichment committee for keepers.

Collections Manager and Babirusa SSP (Species Survival Plan) Coordinator Penny Kalk and WCS Conservation Associate Rob Lee received a Conservation Endowment Fund grant to conduct the first systematic population and habitat assessment of babirusa in Central Sulawesi, Indonesia.

Associate Curator Colleen McCann completed a habitat assessment and census



of mantled howler monkeys in coffee plantations surrounding Mombacho Volcano Nature Reserve in Nicaragua. The next phase of this WCS Conservation Award project is to develop incentives for plantation owners and laborers to continue to produce shade-grown coffee. The goal is to create community support for managing these agricultural lands for more general conservation purposes.

Ornithology

The year was marked by losses of birds to West Nile virus. These birds, which had been in the collection for years, were not only valuable components of our conservation and exhibit programs, but well known to the people who worked with them every day. A great deal of time was spent dealing with the consequences of these losses and finding solutions to the problems.

The Bronx Zoo was the first place to react to the summer 1999 die-off of crows that heralded the West Nile outbreak. Bird keepers are constantly sensitive to the conditions of wild birds in the park. When they began to find sick and dead crows, they took them to the Wildlife Health Center. Soon, Chief Pathologist Tracey McNamara began to diagnose symptoms of encephalitis in flamingos, cormorants, eagles, and other birds in our collection. Ornithology responded by mosquito-proofing facilities, removing standing water, and working with WCS veterinarians to explore options for protection and treatment in the event that West Nile recurs.

Among the many hatchlings during the year were fairy bluebirds, crested wood partridges, white-naped cranes, scarlet ibis, Mauritius pink pigeons, Marianas fruit doves, Montezuma oropendolas, and birds of paradise. The department was presented with the AZA Edward H. Bean Award for long-term breeding of red and lesser birds of paradise. Offspring have been sent to zoos in Cologne, Germany, and England. The Aquatic Birds facility received a face-lift, with a series of dramatic interpretive graph-

ics. It is the new home of our goliath heron.

Ornithology Curator Christine Sheppard introduced a new exhibit to the Lila Acheson Wallace World of Birds. The display explains population biology concepts to zoo visitors by following the fates of 100 robin eggs for a year. In addition, Sheppard developed management plans for lesser adjutant storks and carmine bee-eaters. Sheppard and department Chairman and Curator Donald Bruning co-chaired the AZA TAG for Galliformes and helped to organize and contributed several papers to the Galliformes Conservation and Management Workshop. Sheppard worked on a subcommittee of the AZA WCMC committee to produce a new manual of procedures for AZA conservation programs. And she participated in collection planning for all six WCS living institutions.

The ornithology department has had a tradition of training local people to work with captive birds in other nations, such as Malaysia, Indonesia, Uganda, Singapore, the United Kingdom, and Papua New Guinea. People from those and other countries have been trained at the Bronx Zoo as well. During the year, Dominica Durant from Chile spent two months learning handrear-

ing techniques for altricial species and rotating through all department operations.

In August, Bruning traveled to Papua New Guinea (PNG), where, as a member of the board of the Research and Conservation Foundation, he participated in planning for the Crater Mountain Wildlife Management Area. He also helped local growers find markets in the United States for their shade-grown coffee—including the new Bronx Zoo Store. This program will generate funds for conservation in PNG. Bruning also met with the Malaysian Wildlife Department to discuss conservation programs, particularly for pheasants. In April, he represented WCS and AZA at the CITES (Convention in International Trade of Endangered Species) meetings in Nairobi, Kenya. Once again, Bruning lent his expertise to and served on the boards of the American Pheasant and Waterfowl societies, the World Pheasant Association-US, Faunalink, and the Bahamas National Trust.

Assistant Curator John Rowden continued his studies of Bulwer's wattled pheasant in Borneo and collected data on the species' preferred habitat structure and movements between rainy and dry seasons. That information was helpful in improving the pheasants' Bronx Zoo habitat. With the help of



Opposite: A goliath heron makes its home in the Bronx Zoo's Aquatic Birds Building. **Above:** Ornithology Department Chairman and Curator Don Bruning helped Papua New Guinea coffee growers find U.S. markets for their ecologically sensitive shade-grown coffee (left).

summer interns, he collected data on the birds' vocalizations and the effects of additional protein sources on behavior. Rowden also participated in the annual meeting of the Society for Conservation Biology and the Asia-Pacific Congress on the Biology of the Environment, in Singapore. And he contributed a paper to the Galliformes Conservation and Management Workshop.

Herpetology

Turtles and tortoises around the world are in the midst of a survival crisis, with nearly half of the species threatened with extinction. A global economy, combined with age-old cultural practices, supports a colossal wildlife trade to Southeast Asian markets, where turtle meat is sold as a delicacy and shells as a cure for cancer. The trade in

the world's rarest tortoises, as well as the black mountain and the yellow tortoises. The team surveyed the hilly, forested regions where these species are systematically collected and smuggled to international markets. They also visited remote villages to explore traditional uses of this natural resource. WCS staff, local villagers, and stewards of the Swesettaw Wildlife Reserve collaborated on an action plan for the conservation of the star tortoise in the reserve, including captive breeding, reintroduction, public education, and field research.

Although the disappearance of herp species is most apparent in Southeast Asia, the long arm of international trade also reaches into our own backyards. More than seven million of our native turtles are exported to foreign markets each year. In our continuing efforts to preserve the North American species and their habitats, the department, together with the U.S. National Park Service, launched an inventory of reptiles and amphibians in ten parks in the Northeast, ranging from 70-acre Weir Farm National Historic Site, in Connecticut, to Maine's Acadia National Park, at 40,000 acres. In addition, a study is under way at Delaware Water Gap National Recreation Area. Less than 100 miles west of New York City, DEWA covers nearly 70,000 acres and habitats from river islands to cactus barrens. These diverse habitats support 26 amphibian and 24 reptile species. The goal of this project is to determine the status of endangered and threatened reptiles and amphibians, identify critical habitats, and provide base information for long-term monitoring and proper management.

More than 300 reptiles and amphibians hatched or were born in the World of Reptiles' Nursery. The most notable included the critically endangered Tanzanian pancake tortoise, Asian tentacled snake, Parker's snake-neck turtle, Merten's water monitor, Hamilton's pond turtle, and Chinese flying frog. The pancake tortoise and the Parker's snake-neck turtle hatchlings were firsts for the department, and the latter is the first birth at a North American zoological institution. African rhinoceros vipers, a



Above: a Parker's snake-neck turtle at the World of Reptiles.

Opposite: Wildlife Conservation Associate William Zovickian with local conservation officers in Myanmar. Left: a palm cockatoo chick hatched at the Wildlife Survival Center.



chelonians is measured in tens of tons per day—more than 10 million turtles a year. Fragmentation, modification, and pollution of critical habitats have worsened this situation. Asian turtle species are the hardest hit and require the most urgent conservation action. Without intervention, these populations will continue to shrink, and some will disappear. In response to this crisis, Curator John Behler and Collection Manager Bill Holmstrom, accompanied by tortoise specialist William Zovickian and WCS field biologist Steven Platt, traveled to Myanmar to investigate the Burmese star tortoise, one of

king cobra, a New Guinea green tree monitor, and a breeding group of New Caledonia giant geckos were acquired. New exhibits were prepared for the rhino vipers and the geckos.

The AZA Radiated Tortoise SSP, coordinated by Collection Manager William Holmstrom, provided funding for radiated and spider tortoise research in southern Madagascar. Curatorial Intern Christina Castellano was appointed coordinator for the new Indian Star Tortoise Regional Studbook. Wild Animal Keeper Lisette Ramos led a hognose snake research team at Sandy Hook National Recreation Area and Floyd Bennett Field. Senior Keeper Sam Lee continued to survey eastern box turtle populations on Long Island.

St. Catherines Wildlife Survival Center

The daily trip to St. Catherines Island Wildlife Survival Center is not your average commute. Most mornings, the 11-mile journey to the barrier island is an enchanting glide toward the sun rising over the Atlantic Ocean. Seasoned WCS and St. Catherines Island Foundation (SCIF) staff members, however, know better than to take the serene waters for granted, especially in late summer and early fall. Staff must always be prepared for tropical storms that could culminate in one of nature's most destructive furies: a hurricane. During the year, the island crew put their emergency skills to the test and joined the millions in the southeast who fled from the path of Hurricane Floyd.

Early on September 13, we were ordered to evacuate. The crew had boarded up windows, stowed equipment, backed up computer files, and prepared animal crates. On evacuation morning, we crated and transported more than 100 birds, reptiles, and mammals by van and truck in the largest wildlife evacuation in American history.

Hours and many adventures later, we gathered at our rendezvous point on the edge of the storm and waited. Finally, late the following day we learned that Georgia would be spared direct impact from the hurricane. We then headed back to St.



Catherines Island, relieved to find that it had sustained only minimal damage. The team appreciated the cooperation and support received from other zoos and friends.

The smallest evacuee was a three-week-old hand-reared palm cockatoo. This notable hatchling, the first offspring from a founder pair, had to be fed every two hours and still managed to grow during his travels. Floyd thrives along with his sister, Irene, named after the eighth hurricane of 1999.

Other notable occurrences in the avian collection were the incubation, hatching, and parent-rearing of both a wattled and a northern helmeted curassow—the first time each of these species has been parent-reared at the center. The hatching of a rhinoceros hornbill chick marked the first successful

facility breeding of a large hornbill species.

Of equal, if not more, significance was the hatching of a Madagascan spider tortoise—the first successful breeding of this species outside Madagascar. The center also hatched 22 radiated tortoises, another Madagascan endemic species.

In March, an International Duiker Workshop was held on the island. It was sponsored by the St. Catherines Island Foundation and planned jointly by center staff and the WCS nutrition and mammal departments. The two-day meeting focused on identifying problems in this challenging genus and outlining action plans.

The Edward John Noble Foundation continued its support of WCS's activities on the island.



New York Aquarium

The new seahorse exhibit, which opened in April, features several species of seahorses and their odd-looking relatives the sea dragons, pipefish, and shrimpfish. From males who give birth, to leafy and weedy sea dragons that can blend into their habitat almost perfectly, these beautiful animals enchant visitors. The exhibit graphics raise public awareness of the threats to seahorse survival, such as habitat loss, bycatch in the shrimp fishing industry, and use in traditional Chinese medicines. The

exhibit received a great deal of media coverage, including CNN nationally and all local media. In addition, a mural focusing on seahorses was painted on the wall of Education Hall that faces the boardwalk by volunteers from Goldman Sachs.

Events such as Caribbean Carnival, From Russia With Love, and Aquatic Asia reached out to the ethnically diverse neighborhoods that make up New York City. A Spring Spruce Up campaign improved the Aquarium's fencing, planting areas, and parking lot. Aquarium sponsorship of the

WNBA New York Liberty resulted in a visit by the Aquaravan to Madison Square Garden and an autograph signing session at the Aquarium by Liberty rookie-of-the-year, Becky Hammon.

The 4,000-square-foot addition added to the Coastal Waters exhibit was completed and will become the home of a spectacular exhibit called Alien Stingers, which will feature sea jellies, anemones, and corals. Park-wide lighting was installed to improve viewing of the animals above and below water during evening events. The historic Brighton Beach Carousel Pavilion was saved from demolition to make way for development. The pavilion will be rebuilt at a later date on Aquarium grounds to serve as a visitor center and education facility.

Osborn Laboratories of Marine Sciences

The primary programs of the Osborn Labs are the conservation of coral ecosystems, coastal zones, aquaculture technology, microbial ecology, parasitology, and marine mammal behavior and cognition.

OLMS Director Paul Boyle led The Ocean Project, an international initiative intended to significantly raise public consciousness of the importance, value, and sensitivity of the oceans. Grants from the David and Lucile Packard Foundation and The Pew Charitable Trusts allowed The Ocean Project to complete the most comprehensive survey ever conducted on public opinion about the oceans. The survey demonstrated that, although many organizations promote ocean conservation, their success is thwarted because the environment is a lower priority to people than other issues. Furthermore, people generally do not perceive ocean issues to be among the most serious environmental problems. The research identified an important framework for increasing ocean awareness, which will be used by The Ocean Project's partner aquariums, zoos, and science, technology, and natural history museums to build an understanding of the significance of the oceans among the 140 million annual visitors to their institutions. Based on the sur-

THE OCEAN PROJECT SEEKS TO BUILD PUBLIC AWARENESS OF THE VALUE OF THE SEAS

vey results, The Ocean Project is planning a nationwide training program to shift the way conservation efforts link people to caring about and responsibly taking action on behalf of the oceans.

The Ocean Project Director William Mott has increased partnership across the U.S. to more than 170 institutions and organizations that have formally agreed to collaborate on promoting ocean conservation. The Bahamian government announced plans to create a nationwide system of marine reserves. Because the success of such reserves largely depends on effective public education about their purpose and value, OLMS scientist William Alevizon is working closely with the Bahamas Department of Fisheries and The Bahamas Reef Environmental Education Foundation to launch a new public awareness initiative called The Bahamas Ocean Project.

OLMS scientist Diana Reiss continued her research on communication and cognitive capabilities in bottlenose dolphins, particularly the animals' capacity to recognize themselves in a mirror. This is the first such demonstration in a non-primate.

OLMS scientist Andrew Baker continued his groundbreaking genetic research on the critically important zooxanthellae, symbiotic algae that live within coral tissues. This research has identified many genetically different kinds of zooxanthellae, previously thought to be all alike, in various coral species and even within a given specimen of a single coral species. The coral research staff continued studying environmental effects of UV radiation, temperature, cyanide exposure, and nutrients on corals.

Designated by a United Nations panel as one of the most important reef systems for long-term research, the Glover's Reef ecosystem off the coast of Belize had never before been surveyed for biological diversity and ecosystem structure. Led by Dennis Thoney, OLMS has created an unprecedented collaboration of aquariums across the country to conduct a comprehensive biological survey and geographic information system (GIS) database there.

Paul Loiselle, curator of freshwater fishes

and OLMS research scientist, continued his ongoing survey, in collaboration with Aleksei Saunders of the Denver Zoo, of the poorly known and highly endangered freshwater fish of Madagascar. Captive breeding populations of 14 species have been established. One of these, the pinstripe damba, is now extinct in nature. Loiselle's most recent collecting trip to the northeastern part of the island resulted in the discovery of three new rainbowfishes in the genus *Bedotia* and a new species of the related genus *Rheocles*.

At the request of the Durrell Foundation and the management of Parc Zoologique d'Ivoloina, Loiselle investigated potential reintroduction sites for the fony, an endangered Malagasy cichlid. Contingent upon approval by government agencies, park authorities have agreed to a plan to reintroduce this species in several lakes on the zoo grounds where it once occurred. This will be the first attempt to reintroduce an endangered Malagasy fish to a portion of its historic range from which it has been extirpated.

Central Park Wildlife Center

The behavior management program at Central Park was expanded to include invertebrates, and an artificial log was developed for polar bear behavioral enrichment. Curator Don Moore launched several studies on the behavior of birds and reptiles, and on the response to behavioral enrichment by mammals and birds. Collection Manager Bruce Foster continued his Wyoming toad work and involved keeper staff in the field. The effects of water quality on developing Wyoming toad tadpoles were studied. Supervisor Anthony Brownie participated in the Cottontop Tamarin SSP masterplanning workshop.

The Horticulture Department removed original plantings and wooden supports of the living wall in the Tropic Building. Steel supports were added, planter pockets redesigned, and new species of vines planted.

Greater attention to risk management resulted in establishment of a dive safety team, protocols, a new dive locker, and scuba certification for four more staff members, as



Opposite and top: A seahorse exhibit opened at the New York Aquarium, and seahorses were featured in a mural (above) painted by volunteers from Goldman Sachs. Middle photo: a pinstripe damba from Madagascar.



At Prospect Park: a baby Hamadryas baboon (opposite) and a blue dart poison frog (above). **Top:** a sea lion kiss at Central Park. **Middle:** the domestic animal area at Queens.

well as CPR certification of more staff. Veterinary Technician Berni Leahy assumed editorship of the Association of Zoo Veterinary Technicians' newsletter. The Wildlife Gallery featured photographic images from Kenya, Tanzania, and Uganda and Yosemite National Park by WCS Trustee and wildlife photographer Elyssa Kellerman.

Prospect Park Wildlife Center

One of the year's most significant births, and a particularly poignant success story, was a male Hamadryas baboon, born in June to four-year-old Matera. As a youngster, Matera was confiscated as an illegal pet in Chicago in 1997. Because she had not acquired baboon skills, she had to be integrated into the Wildlife Center group. It took two years before the other baboons fully accepted her. The staff was particularly concerned that this first-time mother would not have the proper parenting instincts, but mother and baby got along just fine. Other births and hatchings included a cottontop tamarin, prairie dogs, Madagascan day geckos, and dart poison frogs.

Staff initiated a program of operant conditioning with the cottontop and black lion tamarins. The conditioning program for the sea lions was strengthened after Animal Department staff Shoshanna Abeles, Kris Ampela, and Jennifer Skelly attended the International Marine Animal Trainers Association Northeastern Regional Workshop.

Ric Urban joined the center as Assistant Curator of Animals. He also serves as an advisor to the editorial board of *Communique*, the professional journal of the American Zoo and Aquarium Association. Shoshanna Abeles was promoted to Supervisor of Wild Animals.

Special events such as the national Kratt Brothers' Zoo Tour helped attract more than 228,000 guests during the year.

Queens Wildlife Center

Queens Wildlife Center received a significant grant from Queens Borough President Claire Schulman for construction of a new

exhibit for the thick-billed parrot. The display will feature one of the largest flocks of these endangered parrots in captivity.

An adult and an immature bald eagle were introduced as part of a program to exhibit several species of raptors in the spacious geodesic dome aviary. Two Florida sandhill cranes were hatched and reared by the parents. The cranes will be released at the Wildlife Survival Center on St. Catharines Island. Animal department staff participated in the WCS jaguar study and mammal monitoring program in the Cockscomb Basin Wildlife Sanctuary in Belize.

Wildlife Health Sciences

The Wildlife Health and Sciences Committee, chaired by Mrs. Ann Unterberg and co-chaired by Dr. Judith Sulzberger, maintained its support and contact through meetings featuring presentations on the role of Wildlife Health Sciences in the WCS living landscapes conservation initiative. The department benefited from the support of the Sally and Julius Smolen Foundation.

The emergence of West Nile virus defined the year for both the departments of Pathology and Clinical Care. Chief Veterinarian Robert Cook and Pathology Department head Tracey McNamara worked closely with City and State Health department officials during the winter to respond to possible reappearance of the virus in spring. Cook received a grant from the New York State Assembly to host the West Nile Virus Action Workshop, which brought together experts in entomology and veterinary and human medicine to discuss the state of knowledge and planning with specialists from the federal, state, and city veterinary and human health agencies. Proceedings of the workshop have proven to be a useful resource in efforts to control this potentially deadly disease of wildlife and people. A mosquito surveillance program was established at all WCS parks, and mosquito control measures were instituted in a sound ecological method to decrease breeding sites and eliminate larvae. At the Bronx Zoo, Durland Fish of Yale University and a team of entomologists trapped and

identified mosquitoes to determine breeding hotspots that could be eliminated. The veterinary staff worked closely with the animal departments to determine methods of prevention in our animals and criteria for safe animal movement.

Clinical Care

Elizabeth Marie Rush joined the staff in our three-year clinical residency training program in zoological medicine. Tracy Clippinger became board certified in the American College of Zoological Medicine. The Wildlife Health Sciences Department has four certified specialists in zoological medicine, a unique achievement among zoos.

Timmy, the Bronx Zoo's 40-year-old gorilla patriarch underwent a major procedure to treat a severe chronic sinus infection. After being anesthetized by Senior Veterinarians Bonnie Raphael and Paul Calle, Timmy underwent a CAT (computerized tomography) scan via a mobile unit. He was then moved into the surgery for a two-hour procedure performed under the watchful eye of Health Sciences Consultant and WCS Scientific Fellow Dr. Jim Grillo. Timmy quickly recovered and shortly thereafter began to breed females in his troop for the first time since moving to the new Congo Gorilla Forest facilities.

In the early days of the West Nile virus outbreak, many hours were consumed diagnosing and treating clinically ill animals, mostly birds, at the Bronx Zoo and Queens Wildlife Center. After the acute phase of the disease came months of collecting blood samples from animals at all of the New York-based facilities to try to determine the extent of infection in animals that had not become visibly ill. Veterinary technicians processed more than 650 blood samples, preparing them for shipment and, most important, keeping accurate records, as well as performing regular duties. In addition, samples that had been collected years earlier and stored frozen in our biomaterials bank were retrieved and tested to provide evidence that the disease had not been present in WCS animals prior to 1999. In response to the outbreak, Tracy Clippinger, in co-op-

eration with the Bronx Zoo Ornithology Department, undertook a study to evaluate the safety and efficacy of a vaccine for use in birds to protect against West Nile virus.

Senior Veterinarian Paul Calle and Assistant Veterinarian Tracy Clippinger maintained regular visits and emergency response at the City Wildlife Centers and New York Aquarium. At the New York

Aquarium, one of the walruses swallowed foreign objects thrown in the exhibit. A specially designed endoscope produced by Olympus America was used by Cook and Calle and the Aquarium and Health Center team to remove them. These efforts were greatly aided by WCS Conservation Associate Dr. Lin Klein, a large animal anesthesiologist from the University of Pennsylvania.



WCS WILDLIFE HEALTH SCIENCES WAS INSTRUMENTAL IN IDENTIFYING THE WEST NILE VIRUS

Pathology

Prompted by concern that wild crows might be spreading viral encephalitis to our collections, Department Head and Schiff Family Distinguished Scientist in Wildlife Health Tracey McNamara launched an investigation that ultimately resulted in the discovery of West Nile virus, never before seen in the Western Hemisphere. In doing so, the department awakened the larger medical community to what WCS has always known: animal, human, and ecosystem health are all interrelated. Collaborative ties were es-

tablished with the Department of Defense and colleagues at the United States Army Medical Research Institute in Infectious Diseases at Fort Detrick, the New York City and New York State Departments of Health, the Mayor's Office of Emergency Management, the National Wildlife Health Center, the Pasteur Institute, and the Centers for Disease Control and Prevention.

McNamara lectured on the Zoonoses Panel of the International Conference on Emerging Infectious Diseases in Atlanta, participated in a roundtable discussion on

"The Impact of West Nile Encephalitis on New York City" at the invitation of Senator Charles E. Schumer, and presented the Litwack Lecture at North Carolina State University College of Veterinary Medicine.

The rapid diagnostic immunohistochemical technique described in a publication by Health Center staff and colleagues will make it possible for all veterinary laboratories to screen for the virus. Having received specialized training, Laboratory Supervisor Alfred Ngbokoli now routinely performs the test in-house for WCS and other zoos.

Although it seemed like it at times, West Nile virus was not our sole activity. Assistant Pathologist Michael Linn traveled to Mongolia, with Field Veterinarian Sharon Deem, to assess the health of Mongolian gazelles on the eastern steppes at the request of the Mongolian government and the United Nations Development Program.

The Pathology Department was supported by gifts from WCS Advisors Caroline N. Sidnam and Pamela Thye.

Nutrition Department

Department staff performed trials of palatability, digestibility, and health assessment for browsing rhinoceros, leaf-eating primates, and fruit-eating birds, bats, and ungulates. Laboratory analyses of native food samples collected in field studies included evaluation of nuts and fruits eaten by palm cockatoos and birds of paradise in Papua New Guinea, foods consumed by giant forest hogs in Uganda, and the diet of Tibetan gazelles. Volunteers and students monitored the impact of plant chemistry and dietary pH on iron absorption in herbivores, food intake and digestion in colobine monkeys, and development of a browse identification handbook.

Under the organizational skills of Program Assistant Marian Glick-Bauer, facilities in more than 30 countries utilized the first release of our dietary management software, workshops were presented in the US and Latin America, and Zootrition™ was adopted as the national standard for two zoological associations. An Internet database of food composition for use by



animal managers was initiated through a Captive Breeding Specialist Group Working Group headed by Ellen Dierenfeld, Marilyn M. Simpson Charitable Trust Distinguished Scientist in Wildlife Health. A department training manual on zoo nutrition, feeding management, and diet examples was translated into Spanish and Portuguese for use in Latin America.

Zoo Nutrition Center expansion proceeded, with input from Dr. Shelli Dubay, Assistant Nutritionist Debra McDonald, and an ongoing internship program. ZNC currently services three facilities in addition to those of WCS.

The department hosted nutrition scientists and students from Australia, Shanghai Zoo, the Netherlands, India, Colombia, and several American universities. Dierenfeld led nutrition workshops in South Africa and Colombia. A workshop was held at the St. Catherines Wildlife Survival Center concerning duiker husbandry, nutrition, and health. Dierenfeld was invited by the British Federation of Zoos to discuss links between nutrition and reproduction in zoo species.

The Marilyn M. Simpson Charitable Trust and The Perkin Fund provided funds for departmental activities.

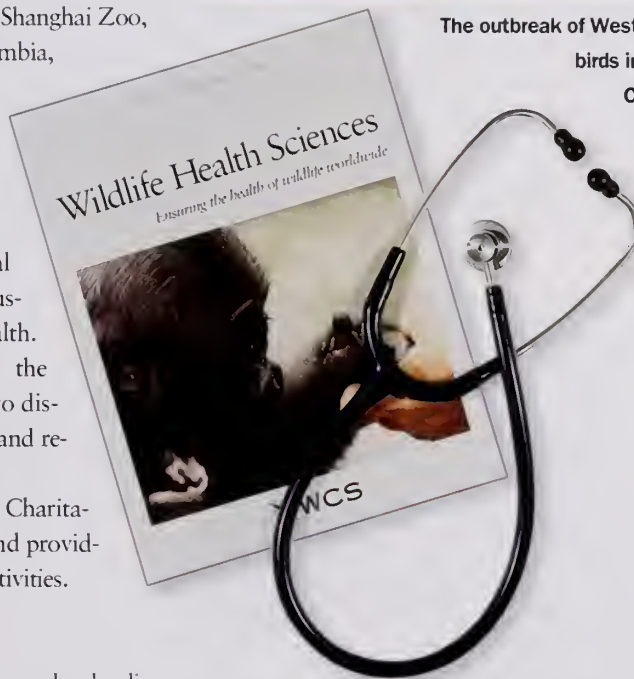
Field Veterinary Program

The Field Veterinary program, under the direction of William Karesh, expanded its field presence in Asia, Africa, and Latin America. Sharon Deem and Marcela Uhart continued to pioneer health studies with various endangered and threatened species in Latin America, while Karesh's projects took him to Timbuktu. In addition, the department added to its Bronx Zoo-based support staff in order to accommodate the team's increased involvement in field projects around the world.

The New York Community Trust awarded the program a three-year grant to cultivate new health initiatives. Caroline N. Sidnam, Dr. Judith Sulzberger, and



The outbreak of West Nile virus in bald eagles (opposite) and other birds in New York became a focus of the Wildlife Health Center. Above: Chief Pathologist Tracey McNamara and Pathology Resident Rosandra Manduca examine a dead crow.



Pamela Thye continued their support. Mr. and Mrs. David T. Schiff added to the field vet endowment.

In central Africa, the program provided training to forest service staff in health monitoring techniques for western lowland gorillas. As ecotourism has brought humans in increasingly closer proximity with these endangered animals, the need for preventive health monitoring procedures has heightened. Another new initiative funded by the New York Community Trust was a small-grants program for wildlife health professionals in developing countries. These field project grants

will provide support for foreign nationals with conservation leadership potential.

Sharon Deem joined WCS field researcher Cynthia Lagueux on the Caribbean coast of Nicaragua, where she collected samples for a health evaluation of green turtles, the first marine turtle health monitoring program in that country. This study is especially important at a time when diseases in marine turtle populations have become increasingly recognized and the survival of this endangered animal is at risk due to shrinking habitat and hunting pressures.

Chief Veterinarian Bob Cook, Doug Armstrong from Omaha's Henry Doorly Zoo, and Kathy Quigley of the Hornocker Institute taught a five-day training course for reserve guards and the Siberian tiger response team in the Russian Far East.

Strategic Operations

The Bronx Zoo Store

As unique as its namesake, The Bronx Zoo Store opened its doors in June. Its high-quality products and spectacular setting add up to a wonderful new shopping experience for Bronx Zoo visitors. The new store sets the stage for an ex-

pansion of the WCS merchandise program.

The Bronx Zoo Store features a full line of premium products, from books and jewelry to clothing and home accessories. The nature-related merchandise and shopping experience reflect the special identity of the Bronx Zoo as well as WCS's commitment to wildlife. Shade-grown organic coffee and handmade crafts from Papua New Guinea are available, and proceeds from their sale help protect that island's wildlife and wild habitats. One-of-a-kind items include jewelry made by Richard Malenky, a former WCS field scientist known for his work with bonobos in the Democratic Republic of Congo.

The 4,200-square-foot store is part of the new food and retail complex under construction at the Bronx Zoo. Key architectural elements from the former turn-of-the-century restaurant/shop building were retained. The entire new complex is easily accessible via a new pedestrian pathway, and the facility includes restrooms, an ATM, and a first-aid station.

Communications and Marketing

The success of the communications and marketing campaign for the opening of Congo Gorilla Forest helped foster the highest summer attendance at the Bronx Zoo in more than ten years. Indeed, media outlets continued to cover the new exhibit through the fall and winter, culminating with the March broadcast of an hour-long Discovery Channel feature about the making of Congo. In the spring, the introduction of a trio of lowland gorilla toddlers to the exhibit was covered by more than 30 print and electronic media.

The New York Aquarium garnered more than 600 media placements. One of the highlights was a CNN report on the new seahorse exhibit that was picked up

by almost 50 affiliates around the country.

Central Park Zoo welcomed its 10 millionth visitor in March and a number of major media outlets covered the occasion. In May, the zoo was featured on NBC's nationally syndicated "Later Today" program in a piece about interesting places to visit in Central Park. Queens Zoo received significant media attention on the first anniversary of the coyote found in Central Park. In June, Public Television's popular Kratt Brothers launched their national tour of America's zoos at Prospect Park.

For the first time, sponsorship of WCS events and programs totaled more than \$1 million in cash, in-kind products, and promotional considerations. Pepsi supported the Bronx Zoo's summer long Safari 2000 event, and Con Edison presented the zoo's Holiday Lights program, with additional support from American Airlines, Fuji Film, Pepsi, and Wendy's.

The WCS web site was significantly ex-

panded in 2000 to include micro-sites devoted to Congo Gorilla Forest, Brazil's flooded forest, and the Save the Jaguar campaign. A new children's section was added. By year end, web traffic increased to more than 5,000 unique users per day.

WCS's field conservation project in Brazil's Mamirauá Reserve was featured in a five-part "Our Planet" series on CNN. *The New York Times* science section ran front-page stories on WCS international researchers working with tigers and mandrills. *Vanity Fair* magazine utilized WCS as an information source in an exposé on illegal trading of Tibetan antelope skins. Education department teacher-training workshops were featured in an article in the New York *Daily News*, and summer camps were covered by the *Daily News* and WABC-TV.

Julia Mair, a former National Geographic Television executive, joined WCS as director of television and media.

Wildlife Conservation Magazine

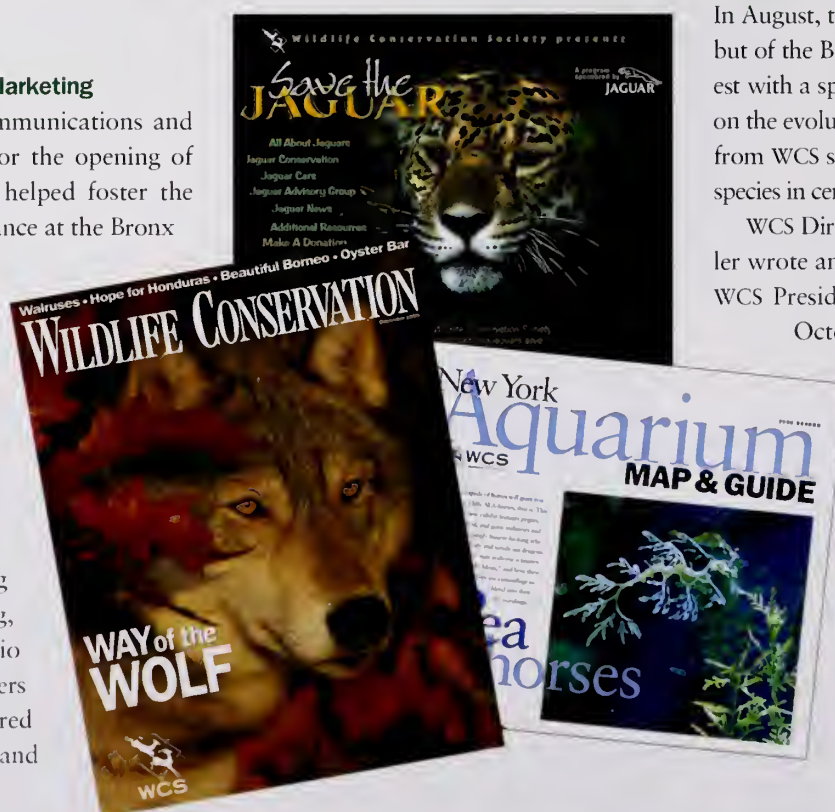
In August, the magazine celebrated the debut of the Bronx Zoo's Congo Gorilla Forest with a special issue interweaving articles on the evolution of the exhibit with features from WCS scientists working on landscape species in central Africa's rain forest.

WCS Director for Science George Schaller wrote an eloquent tribute to out-going WCS President William Conway for the October issue. Schaller acknowl-

edged Conway's contributions to the wildlife conservation movement. In his tenure as head of WCS, Conway redefined the role of zoos, from exhibition of animals to sustaining life that is vanishing from the wild.

Wildlife Conservation magazine won the silver 1999 Ozzie award. Other publishing activities included

the WCS Annual Report, the visitor maps for the five New York City-based wildlife parks, and numerous newsletters, brochures, and reports.



Above: Communications and Marketing produces publications such as *Wildlife Conservation* magazine, maps and guides, and the web site. Opposite: the Bronx Zoo Store.



Exhibits and Graphic Arts

Programmers and designers worked closely with the staff to develop the Bronx Zoo's Master Plan. In addition to shaping exhibits, the Master Plan will improve visitor circulation and public services to focus on conservation experiences. It will also address the aging infrastructure.

Concurrent with designation of 100-year-old Astor Court as a City Landmark, the City Council and Executive branch initiated the first \$5 million challenge grant to restore the historic Lion House.

Bronx Zoo masterplanning includes new animal propagation zones. The proposed Conservation Promenade will begin with the spectacular Tiger Kingdom. Visitors will see how these great cats swim and hunt in their taiga forest. Behavioral enrichment programs will enable tigers to behave naturally as predators. The heart of Tiger Kingdom will showcase WCS's global leadership to save wild tigers in Asia and enable visitors to get involved.

A major planning study was initiated to address the severe need for additional office space at the Bronx Zoo. Interim

plans and temporary offices were prepared.

Masterplans for the three City zoos include three new exhibits, new classrooms, and a frog rescue center, as well as a City-wide interactive interpretive plan. Aquarium plans include rebuilding the main hall, a new plaza with relocated Aquatheatre, and projected need for a new great bay for belugas and walruses. Designs advanced rapidly with Citywide funding for a new hospital and sunshade for Aquatheatre visitors.

Alien Stingers, a new exhibit at the Aquarium, will feature mesmerizing jellyfish, stinging anemones, and spectacular corals. The first display of the entire group of jelly relatives, Alien Stingers includes a hall of living jellies with huge deep ocean tanks, WCS conservation action stations, and interactive exhibits.

At the Queens Wildlife Center, designs advanced on a new aviary for the endangered thick-billed parrot.

Aquarium designers and fabricators worked hard for the spring debut of the seahorse exhibit, which also features a display on human consumption of seahorses. At the Bronx Zoo, interpretive graphics were in-

stalled in Aquatic Birds and World of Birds, the red panda Himalayan Highlands display was expanded, modifications were made to Congo messages, and a series of Brazilian bird guides was under way.

Part of the Bronx Zoo's new Lakeside visitor center opened in late spring, nine months ahead of schedule. When complete, it will overlook a new Pierrepont Marsh, which is being rebuilt to provide more space for the burgeoning flamingo flock. Similar designs for a Seaside Café at the Aquarium neared completion.

Support from the National Science Foundation enabled WCS to engage one of the nation's foremost exhibit evaluators to study Congo Gorilla Forest. We learned that 70 percent of the visitors who voted wanted their entry funds to benefit specific African projects; 93 percent felt being able to choose how their conservation dollars are spent in Africa is important, and over 65 percent could describe later where their own funds went. Exit interviews indicate that the film clarifies conservation importance and the voting improves and enhances their understanding of conservation.





Living **CLASSROOMS**

WCS is a leader—locally, nationally, and internationally—in educating youngsters and adults to become concerned about the survival of wild animals and wild habitats.



THE DAWN OF THE NEW MILLENNIUM brought exciting changes to the efforts of WCS to bring wildlife conservation education to its millions of constituents and to the general public. During the year, the five education departments of WCS were consolidated into a single Education Division under the leadership of Annette Berkovits, Senior Vice President and Chauncey Stillman Chair in Wildlife Education. This change will allow the education departments at the Bronx Zoo, the New York

Aquarium, and the wildlife centers at Central Park, Queens, and Prospect Park to work even more closely together.

A unified vision and closer coordination among the educators at the WCS living institutions enhances our ability to serve local, national, and international audiences even more effectively. The Education Division will continue to provide innovative programming for children, adults, families, and professional educators as WCS lays the groundwork that will lead current and future generations to care about wildlife and to work to help protect the environment.

The first group of C.V. Starr Environmental Education Fellows from China (above, with Senior Vice President Annette Berkovits) attended workshops at the Bronx Zoo. The master teachers also learned about nutrition and conservation efforts for the giant panda (right).

Bronx Zoo Education

Project T.R.I.P.S. (Teaching Revitalized through Informal Programs in Science), a new effort supported by the National Science Foundation, provided a forum for WCS to illustrate its leadership in providing professional development for educators from informal science institutions all over the United States. Teams of 40 teachers and administrators from 12 institutions, including San Diego Zoo and Carnegie Museum of National History in Pittsburgh, developed action plans during a two-week workshop at the Bronx Zoo. Topics included difficult issues in education, such as content standards, assessment, and inquiry-based approaches to teaching. T.R.I.P.S. breaks new ground in revitalizing life science education by changing the relationship between informal science institutions and schools.

With support from The Picower Foundation, Toyota USA, and the CZ Foundation, a record-breaking 250 teachers participated in national program training institutes at the Bronx Zoo. A teacher-training workshop held in South Dakota brought the number of states using WCS science curricula to 50. A pilot teacher membership program, which helps educators nationwide add the wonders of wildlife to their curricula, was launched. Members' benefits include personalized e-mail answers to class research questions about wildlife and access to a special web site providing a variety of educational resources.

The Bronx Zoo completed its first year of Project I.M.A.G.I.N.E. (Innovative Model for the Advancement of the Gifted through Inquiry in Nature and the Environment). Funded through the U.S. Department of Education's Jacob Javits Program, Project I.M.A.G.I.N.E. teamed third- and sixth-grade teachers from schools that serve low-income neighborhoods in and around New York City. The Bronx Zoo Education Department worked with Columbia University's Teachers College to help educators identify





sixth-grade students gifted in the natural sciences. These students will be trained in fall 2000 to serve as Junior Zoo Guides. The following year, as seventh-graders, the students will develop their communication skills and self-confidence as they are paired with experienced Bronx Zoo docents to provide information to zoo visitors.

WCS continued to be recognized for its leadership position in international environmental education. The Bronx Zoo's Education Department won the American Zoo and Aquarium Association's 1999 Significant Achievement Award in Education for the Second Pan-American Congress on the Conservation of Wildlife through Education, conducted via the worldwide web. Education programs in China and Papua New Guinea expanded, with major new initiatives to build sustainability by developing in-country master teachers who are capable of training their colleagues.

In June, the first group of 12 C.V. Starr Environmental Education Fellows arrived from China. These master teachers, selected as the most effective implementers of the WCS program in China during the past sev-

en years, spent two weeks in workshops at the Bronx Zoo, visited the Aquarium, Central Park Wildlife Center, and Jamaica Bay Wildlife Refuge, met teachers at two New York schools, and learned about giant panda nutrition and conservation from WCS nutritionist Ellen Dierenfeld and about the efforts to save Chinese alligators from conservation zoologist John Thorbjarnarson. A major goal was to prepare the Starr Fellows to lead workshops for new teachers in China in August 2000. Since 1994, WCS has trained more than 400 Chinese teachers and reached more than 45,000 students, with support from The Starr Foundation.

In Papua New Guinea, WCS continued to collaborate with the Research and Conservation Foundation (RCF). Together, WCS and RCF staff provided advanced training to 19 master teachers from previous years and trained 107 new teachers. As in the past, the teachers came from Morobe and Eastern Highlands provinces, as well as from two new provinces: Simbu and Western Highlands. In three years, WCS has trained more than 370 teachers in Papua New Guinea.

Each of the 470,988 children who visit-

ed the Bronx Zoo in school groups and the 32,710 students who participated in on-site formal school programs benefited from their unique encounters with wildlife. Wildlife Biology, an intensive 18-week after-school program for students in grades 10 through 12, was expanded thanks to the generosity of the Charles Hayden Foundation. Previously, this program—which explores topics such as animal nutrition and care, exhibit design, and taxonomy—was available only to students from the Bronx. This year, it was offered to students from Manhattan, Queens, and Brooklyn as well.

During the year, 10,778 adults, families, and children participated in the department's on-site offerings. Some of the 5,627 adults enrolled enjoyed discussing the jaguar with Alan Rabinowitz, director of the WCS Global Carnivore Program. Others donned imaginary safari hats and became wildlife photographers. The best photos were subsequently posted on the WCS web site.

Due to an overwhelming response the previous year, family programs were expanded. Additional sessions of Family Overnight Safari were added, enabling

THE EDUCATION DIVISION BRINGS WILDLIFE CONSERVATION TO MILLIONS OF YOUNGSTERS

more families to pitch tents and become acquainted with the Bronx Zoo's creatures of the night. A total of 1,689 parents and children enrolled in Family programs.

New children's programs proved to be popular, as did encore offerings of past favorites. In Zooney Toons, youngsters met the real life counterparts of animals featured in cartoons and comics, and in Ready for Slime Time, they created a "slimy-skinned" amphibian. A total of 13,462 children participated during the year.

More than 1,500 parents and more than 1,500 teachers participated Congo Gorilla Forest Parent and Teacher workshops. These two-hour programs presented the Congo Gorilla Forest exhibit as an educational tool and cultivated competence in its use. Parents, mostly from local under-served communities, were introduced to the unique design and layout of Congo Gorilla Forest. Parents also learned how to create an exciting educational visit with their children, and upon completion of the workshop, they received a Family Adventure Kit to be used during a future family visit. Education programs in the Congo exhibit are supported by The Morris Family Foundation.

The Congo Teacher Workshop was mandatory for educators visiting the Congo exhibit with their classes, ensuring that students truly benefit from the exhibit's complex concepts and features. Teachers who participated in the workshop received special grade-specific education packets. Multidisciplinary materials in the packets included background information, pre-visit, in-zoo, and post-visit activities, lesson plans, posters, and more. All materials were aligned with New York and National Science Education Standards and focused on raising student awareness of adaptations, animal behaviors, and the richness of rainforest biodiversity. Materials also emphasized proactive steps that students can take to save and protect wildlife and habitats. Two sets of the Congo Gorilla Forest materials, the Family Adventure Kit (Parent Workshop) and the C.A.R.E. (Congo African Rain Forest Explorations) Packet for K through three teachers (Teacher Work-



Left and below: Through dynamic programs like Pablo Python Looks at Animals, the Education Division teaches young people about the threats to real species, such as Samantha (opposite), a reticulated python whose record-setting length saved her from hidehunters.



shop), were named Distinguished Achievement Award finalists in the Association of Educational Publishers competition.

S.P.A.R.K.S. (Supporting Parents in Advocacy, Reform and Knowledge in Science) encouraged parents and teachers to work together to improve science education. In its third year, 118 parents and teachers from 35 schools in New York City, Yonkers, and Mount Vernon took part. During six Bronx Zoo workshops, participants produced science newsletters and created family science workshops that they subsequently conduct-

ed at their schools. They also developed and staffed the second annual S.P.A.R.K.S. Family Science Fair, held the last weekend in July. More than 19,200 zoo visitors attended, engaging in dynamic family games and activities that stressed the value of science and the importance of meeting high standards in life science education. The Greenwall Foundation provided crucial support for S.P.A.R.K.S.

WCS partnered with the Homes for the Homeless to provide life science programming to children ages five through 12 who

reside in a temporary housing development in the South Bronx. During this three-month program, zoo instructors traveled to the residence to teach children lessons from the Pablo Python Looks At Animals and Habitat Ecology Learning Program curricula. To complement the lessons, WCS utilized videoconferencing technology. Via audio and video transmissions, a zoo-based instructor could see and hear the children as well as communicate with them.

The WCS Education Department contin-

ued its multi-year collaboration with the Girl Scout Council of Greater New York to encourage girls' interest and involvement in science. Funded by the National Science Foundation, the Wildlife Science Careers program brought more than a hundred 12- to 14-year-old New York City Girl Scouts to the zoo this winter for behind-the-scenes tours, discussions with women scientists, hands-on learning activities, an overnight adventure, and an interactive career fair. This year, for the first time, Girl Scouts who

graduated from the Wildlife Science Careers workshops were trained to share their new knowledge with Daisy, Brownie, and Junior Girl Scouts citywide. Teaching younger children strengthened leadership and organizational skills of these eighth- to tenth-grade students while broadening the younger scouts' knowledge and appreciation of wildlife. In 2000, WCS hired more than a dozen former workshop participants as paid Girl Scout interns. Paired with female supervisors, these young women worked at the Bronx Zoo and our other zoos.

As we proceed in the new millennium, snail mail is becoming more obsolete and e-mail is evolving into a preferred form of communication. The Friends of Wildlife Conservation volunteers (FOWC) answered 150 to 200 e-mail inquiries a week from adults and children, covering topics such as animal taxonomy, Bronx Zoo history, and animal care. In order to keep up with the influx of inquiries, the volunteers developed and honed computer and Internet skills. A special system was designed for them to quickly access animal facts, lists of web resources, and other pertinent data. While current volunteers were becoming Internet savvy, new recruits participated in the revamped Docent Training Course. The 12-week course, which in past years emphasized animal taxonomy, focused on ecology and habitat destruction.

Docents added new mini-talks to their teaching repertoires for visitors to Congo Gorilla Forest. In addition, Bronx Zoo docents led 19,823 schoolchildren and other visitors on tours. They gave biofact cart presentations to 29,810 visitors and reached 50,620 through mini-talks at exhibits throughout the Bronx Zoo. Through the outreach program, volunteers brought the zoo to 2,395 individuals in hospitals and nursing homes.

The Butterfly Zone began its fifth season on Memorial Day weekend, and the Education Department assumed all aspects of its operation, including animal husbandry. The Butterfly Garden was replanted and several large cut-outs erected in which visitors can literally "picture themselves as a butterfly."

Right: The Wildlife Science Careers Program brought more than 100 New York City Girl Scouts to the Bronx Zoo for workshops and discussions with women scientists. **Above:** Friends of Wildlife Conservation volunteers reached more than 50,000 visitors at Bronx Zoo exhibits such as Big Birds (opposite, Masai ostrich).







Programs such as Upriver/Downriver at the Aquarium (pages 26-27) and Wildlife Theater at Central Park (opposite top), up-close experiences with wildlife (above, a polar bear at Central Park; opposite, bottom, domestic animals at Queens), and state-of-the-art exhibits (opposite, middle, a simulated ostrich eggshell at Prospect Park) make WCS education programs particularly effective in teaching youngsters about conservation.

New York Aquarium Education

In cooperation with our Coastal America partners, the education department hosted the first Career Day at the New York Aquarium. The purpose of the annual event, which was attended by 2,900 students, is to encourage participation in marine science careers. Attendees discussed marine careers with representatives from the Aquarium, New York State Department of Environmental Conservation, U.S. Fish and Wildlife Service, U.S. Coast Guard, U.S. Army Corps of Engineers, City of New York Parks and Recreation, NYC Urban Park Rangers, and Villanova University.

As part of the consolidation of departments, teachers in the Upriver/Downriver program from Brooklyn's Community School District 22 were trained in pond ecol-

ogy at Prospect Park Wildlife Center. Students explored freshwater environments before a visit upstate to the Great Swamp. Upriver children from Dover Plains explored beach environments at the Aquarium.

The department conducted 739 innovative programs for 21,533 schoolchildren in the tri-state area. To strengthen the foundations of learning, the department encourages parental involvement in programs. This year, 200 parents and their youngsters from P.S. 119 Brooklyn attended a family night culmination of a year of science involvement. For the second year, New York State Assemblyman Joseph Lentol of District 50 in Brooklyn chose the Aquarium Education Department to participate in the Member Initiative Grant. In addition to elementary students, the grant provided funds

for pre-school children and senior citizens.

Our second Aquaravan, sponsored by Independence Savings Foundation, traveled to 55 public libraries in Brooklyn with Sensational Sharks, teaching about 1,050 children about shark biology and conservation. The Outreach Team increased its programs by nearly 70 percent over last year, visiting more than 70 nursing homes, 28 hospitals, 100 libraries, and more than 40 schools.

Staff wrote graphics for the new sea-horse exhibit. They also provided information for volunteers from Goldman Sachs, who painted fanciful sea dragons and other invertebrates on the wall of Education Hall, to the delight of boardwalk strollers.

Aquarium docents contributed 28,479 hours to visitor education, touch-it tank supervision, and other departmental needs.

OUR ZOOS AND AQUARIUM PROVIDE UNIQUE OPPORTUNITIES TO EDUCATE YOUNGSTERS

Many of the 250 docents are teenagers or young adults representing more than 130 high schools and colleges. Manny Kam-nash, who at 82 years old is our oldest docent, received the Outstanding Volunteer award from R.S.V.P.

Central Park Wildlife Center Education

Utilizing theater and the arts as well as science to stimulate interest in wildlife conservation, the Central Park Education Department creates unique experiences for visitors of all ages. Wildlife Theater, supported by the Lila Acheson Wallace Fund for NYZS, is a particularly successful strategy for promoting an understanding of nature and an awareness of conservation issues. Talented actors use interactive theater to share animal and conservation facts with more than 550,000 people who visit Central Park Zoo each year. This year, Wildlife Theater was the keynote presentation at Earth Day celebrations in New Jersey's Liberty State Park. In addition, Wildlife Theater's At-Exhibit characters enhanced visitor experiences at the Polar and Tropic exhibits with a theatrical approach to providing information.

More than 100 dedicated Wildlife Guides provided more than 130,000 zoo visitors with nearly 13,000 hours of service, from sea lion narrations to assisting with zoo events such as summer Chill Out.

School programs, addressing local, state and national education standards, reached over 3,000 students. These programs used multi-disciplinary approaches to conservation education and received high praise from visiting teachers and students.

During the year, 160,000 children and parents attended 4,500 performances at the Daniel Cowin Acorn Theater in the Tisch Children's Zoo. These shows introduce animal facts and natural processes to young children through entertaining productions.

Adult programs included a Wine and Cheese evening with WCS wildlife expert Michael Klemens, who discussed the Metropolitan Conservation Alliance. Science illustrator Patricia Wynne conducted a three-session artist workshop. Some of Wynne's

original creations appear in the Bronx Zoo's *Congo Gorilla Forest Family Guide*.

Prospect Park Wildlife Center Education

Participation in weekend workshops and summer camp increased, resulting in a total of 15,221 people attending formal education programs at Prospect Park during the year. Even the winter was busy, with 160 school groups taking advantage of the warm zoo setting. The Wildlife Guide Corps is made up of volunteers, paid interns, and interns from 17 high schools in Brooklyn and Manhattan. Wildlife guides treated zoo visitors to sea lion talks three times a day and answered questions at the barn and wallaby areas. They also manned booths and craft tables and gave "ask the expert" talks during special events such as Millennium Week and Fleece Festival.

Heidi Ruffler joined the education team as Volunteer Coordinator, and Theresa Fannery was hired as Assistant Curator. Fannery is also education liaison to the AZA Anseriformes Taxon Advisory Group.

Queens Wildlife Center Education

The year got off to a great start with our High School Summer Wildlife Guide program. More than 30 students trained as summer volunteers. Those individuals with second-language capabilities helped a number of our visitors learn more about the animals on exhibit.

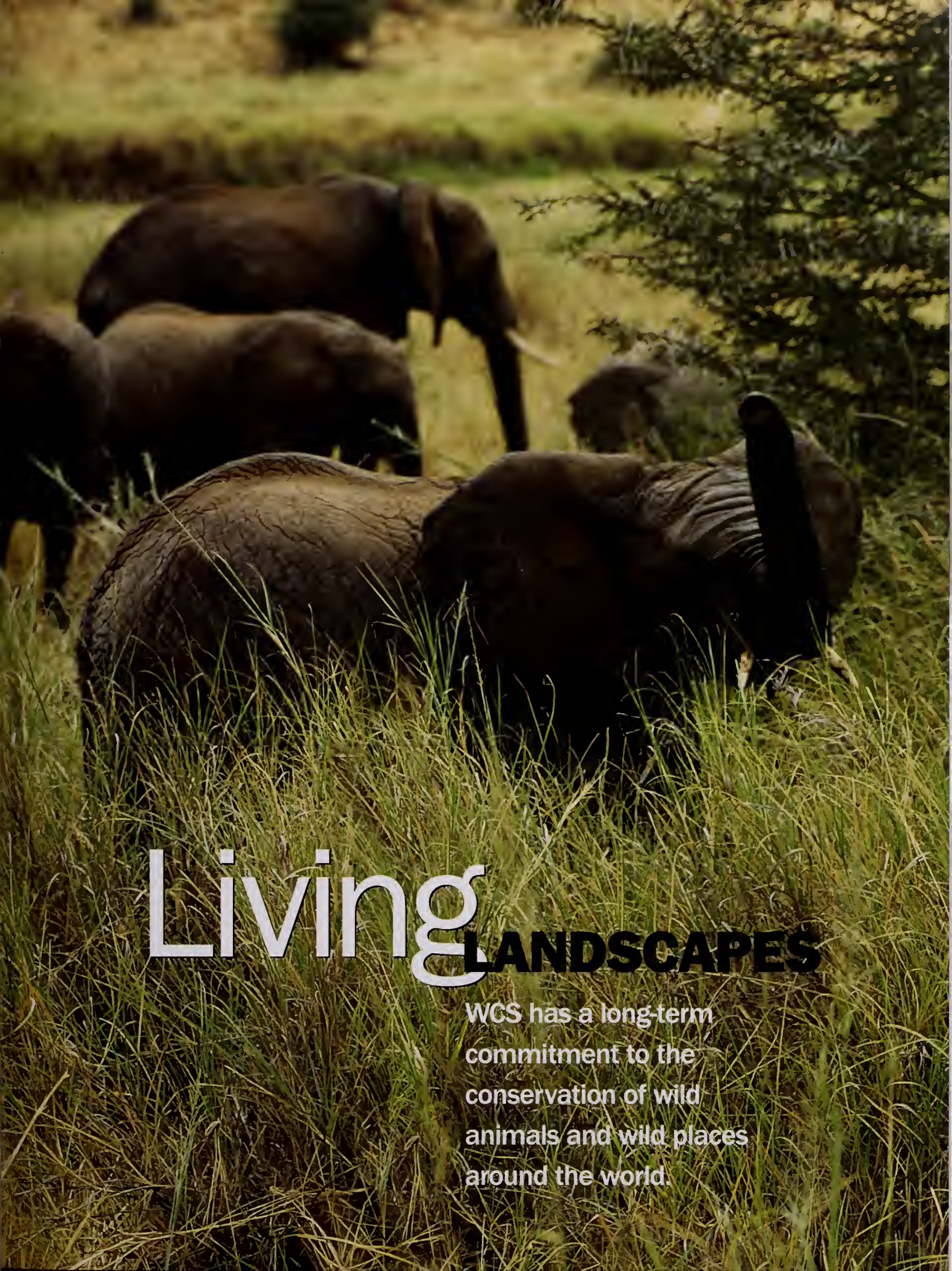
In another new program, Animal Stories from Around the World, participants were treated to animal stories from China, Peru, Poland and other countries. They also worked on various crafts—from fans to masks to origami—based on the tales.

A record enrollment of more than 10,000 students participated in 270 school programs. Local teachers learned about endangered animals and conservation education through introductory tours and school district meetings. Girl and Boy Scout groups came in record numbers to learn about native wildlife in programs and sleep-overs.

Laurel Frankel joined us as an instructor.





A photograph of a savanna landscape with a herd of elephants and a rhinoceros. In the foreground, a rhinoceros is grazing in tall grass. Behind it, several elephants are visible, some standing and some partially obscured. The background shows more elephants and a line of trees under a warm, golden light.

Living **LANDSCAPES**

WCS has a long-term
commitment to the
conservation of wild
animals and wild places
around the world.



DURING THE LAST CENTURY, WCS was instrumental in the creation of more than 130 wildlife parks and reserves around the world. And today we help steward some 50 conservation areas in the Americas, Africa, and Asia. At these sites, our commitment is long-term, and our involvement at many is already measured in decades. We call these places of commitment our living landscapes. They are typically large, relatively intact wild places in which the full complement of animal and

plant life still exists. They also encompass places where human activities—logging, hunting, agriculture—alter the land and affect the lives of animals.

To conserve these living landscapes, we often focus on a set of species that range over vast areas and ecosystems and are particularly susceptible to human disturbance. By figuring out what it takes to meet the needs of these landscape species—elephants, jaguars, flamingos—WCS can conserve much of the full range of biodiversity in our living landscapes.

In some of our projects, we train park

staff, design park management, and help make parks and reserves financially more secure. We work in hunting and fishing areas, forestry concessions, and agricultural areas, seeking to reconcile the aspirations of local people with the needs of wildlife. We identify future conservation leaders and help give them the authority to effect conservation in their own countries. And we take the lessons that we have learned from our on-the-ground experience and use them to influence national and international policies.

The WCS landscape ecology program, supported by the Prospect Hill Foundation, uses GIS (Geographical Information Systems) to map data, providing a powerful analytical and communication tool for conserving living landscapes.

Africa

Africa has stunning landscapes and spectacular wildlife that remain relatively undisturbed by humans. It also has the most land of any continent on which people and large predators still manage to coexist outside protected areas. Yet, these sites are rapidly diminishing, and WCS is working with local protected-area authorities to conserve these landscapes and the animals they contain.

First to disappear from intact landscapes are usually large predators, because they need big territories to maintain functional populations. Most protected areas in Africa are not large enough to ensure the survival of big cats, hyenas, and wild dogs. Therefore, conservation has to look outside as well as inside protected areas. How do you persuade someone with a flock of goats and sheep to allow lions to live alongside them? After all, few ranchers around Yellowstone National Park are keen to have wolves on their properties. In Laikipia, in northern Kenya, Laurance Frank studied the behavior of large predators living around pastoralist farmers and on cattle ranches. He analyzed herding and ranching strategies for the most efficient methods to deter lions and

Pages 36-37: Africa still has stunning living landscapes and spectacular wildlife. At Tarangire National Park, Tanzania, Charles and Lara (above) Foley are studying the social dynamics of the elephant—a landscape species. Opposite: The first animals to disappear from landscapes are usually large predators, such as the lion.





Opposite, top: Margaret Kinnaird and Tim O'Brien coordinate WCS efforts in Indonesia. **The bearded pig (opposite, bottom) and the orangutan (above) are Asian landscape species.**

hyenas. In Tanzania's Serengeti, Sarah Durant focused on cheetahs. More cubs die than survive on the plains, many killed by lions and hyenas. Yet, the population is not decreasing. Durant believes that the rangelands around Serengeti may be very important to the cats' survival. With Tom Madrox, she is encouraging the Masai tribespeople who live there to protect the cheetah.

Elephants, an obvious landscape species, have long been a focus of WCS conservation efforts. This year, we were asked by CITES

(Convention on International Trade in Endangered Species) to set up a pilot program in central Africa for monitoring forest elephants. John Hart, who spent many years with WCS in the Ituri Forest, agreed to lead the project, with support from the U.S. Fish and Wildlife Service and the World Conservation Union (IUCN). This work will likely lead to a continent-wide monitoring program so the impacts of ivory trading can be measured directly from changes in elephant population sizes. Steve Blake studied ele-

phant movements in Nouabalé-Ndoki National Park in Congo Republic. Charles and Lara Foley are investigating changes in social dynamics of elephant herds in Tarangire National Park in Tanzania to find out the long-term impacts of poaching on elephant movement patterns and calf survival.

WCS was asked to provide technical expertise and assume management of Masoala National Park in northeast Madagascar, which it did with support from the John and Marcia Goldman Fund. The largest forest on the island, it is probably the last hope for the Madagascar serpent eagle and several smaller birds as well as lemurs. Cyclone Hudah, which swept across this part of Madagascar, did not damage the forest too greatly. WCS provided relief to people whose homes were destroyed.

Lee White and Kate Abernethy, with support from Edith and John Newberry, continued to study mandrill movements in Gabon's Lopé Reserve. The animals live in groups of more than 700. The research shows, however, that for half of the year there is only one adult male per group. Adult males spend much of the time on their own and move into the group between June and October. This newly discovered type of social organization in primates is changing some scientific theories. It appears that males must be about 11 years of age before they can breed. Protection of adult males is crucial to the species' survival.

In the Ituri Forest of the Democratic Republic of Congo (DRC), Congolese scientists funded by WCS continued to work despite the conflict. Terese Hart visited Epulu several times to give support to the warden of the reserve. She was asked to represent the United Nations on a mission to each of the factions in DRC to promote conservation of the country's natural heritage. Terese and other conservation principals in DRC put together a package of support for the five World Heritage sites there, to be funded by the UN Foundation.

Bryan Curran moved from Cameroon to Congo Republic to manage Nouabalé-Ndoki National Park. He forged closer links with WCS projects in Cameroon and Cen-

tral African Republic to coordinate regional efforts. Paul and Sarah Elkan, with support from the Columbus Zoological Park Association, expanded their work within logging concessions around Nouabalé-Ndoki to include concessions in the east and north. The combined efforts of the park management and buffer area project mean more protection for a landscape of 8,000 square miles. The World Bank acclaimed this a model project that other logging companies should follow. It is hoped that over the next few years we will see changes in logging practices in the Congo Basin. Admission fees earmarked by visitors to the Bronx Zoo Congo Gorilla Forest exhibit supported conservation in these forested sites, as did funding from the John D. and Catherine T. MacArthur Foundation.

A biological survey of Banyang-Mbo Wildlife Sanctuary in Cameroon showed it to be rich in tree and bird species. Supported by the Liz Claiborne-Art Ortenberg Foundation, WCS worked with local communities to reduce the impact of elephant poaching and bushmeat hunting. Projects by John Oates and Kelly MacFarland in eastern Nigeria led to the creation of the Afi Mountains as a wildlife sanctuary for the gorillas that occur here. This population has been identified as a new subspecies, *Gorilla gorilla diehli*, and is the rarest of them all.

In Uganda's Bwindi Impenetrable National Park, the Institute of Tropical Forest Conservation developed long-term strategies and sustainable financing plans. The institute will focus on applied management to ensure survival of gorillas, birds, and plants in this World Heritage Site. In Rwanda's Nyungwe Forest, a workshop supported by the John D. and Catherine T. MacArthur Foundation led to proposals to upgrade to national park status. Nyungwe is one of the largest Afromontane forests in east Africa and one of the richest for endemic birds.

With support from William B. Lloyd, Dale Lewis continued to work in Zambia on the community-based ADMADE program he established there. WCS and Tanzania National Parks put together a strategic plan for the ecology division. Over the next



few years, with funding from the John D. and Catherine T. MacArthur Foundation, David Moyer will organize training courses for park ecologists and build a survey team to look at potential protected areas in the south and west. Lee White conducted his third Congo Basin training course at Noua-

balé-Ndoki, with participants in the elephant monitoring program. With support from CARPE, the John D. and Catherine T. MacArthur Foundation, and Edith and John Newberry, Lee plans to build a regional training center in Gabon to increase the number of biologists with field expertise. Already many of those trained are moving into positions in government and NGOs and will soon be influencing conservation efforts in this region.

Asia

With some of the world's most densely populated areas and most rapidly industrializing economies, Asia represents urgent challenges. As economic pressures and population growth increased the pressures on wildlife, WCS focused on protecting and managing key sites and in finding innovative solutions to human-wildlife conflicts that threaten the future of many landscape species.

Against a backdrop of enormous political instability in Indonesia, Tim O'Brien, Margaret Kinnaird, and WCS-Indonesia staff made good progress on projects and embarked upon new ones. Bukit Barisan Selatan (BBS), the third largest park in Suma-



Above: Kirk Olson and Odonkhuu weigh a Mongolian gazelle. **Opposite:** Part of the WCS project to save the Chinese alligator is to establish new populations with captive-bred animals.

tra, contains some of the last remaining tracts of lowland rain forest in addition to critically endangered species such as Sumatran tigers, rhinos, and endemic subspecies of Asian elephant. With funding from the U.S. Fish and Wildlife Service, WCS-Indonesia launched a project on the ecology of Sumatran elephants and the resolution of human-elephant conflicts in southern Sumatra. The project is being implemented by Arnold Sitompul, Martin Tyson, and Simon Hedges, who evaluated census techniques and trained a research team. The tiger/large mammal survey in BBS headed by Hariyono Wibisono is nearly complete and has provided a wealth of information on tigers and their prey. Other long-term research projects included a study of fruiting patterns, behavioral ecology of siamangs and hornbills, and the effects of fire on lowland rain forests at Way Canguk Research Station. Grants from Save the Tiger Fund, a joint project of the U.S. National Fish and Wildlife Foundation and Exxon Mobil Corporation, and U.S. Fish and Wildlife Service provided critical financial support for the tiger/large mammal project. Private donors, including Edith and John Newberry and Mr. and Mrs. Gary Fink, provided financial support for various aspects of the program.

Terrestrial biodiversity on Sulawesi makes it a unique island in the Indonesian archipelago. Sulawesi has high levels of animal and plant endemism, including macaques, cuscus, babirusa, anoa, and tortoises. This biodiversity is under serious threat from hunting, agricultural encroachment, and plant harvesting. Rob Lee continued his work to establish a comprehensive wildlife and protected areas management program for threatened species. This program encompassed training of NGO members and forestry department personnel, an urban awareness campaign, and publications. His work is supported by the U.S. Agency for International Development and the Walt Disney Company Foundation.

Gunung Leuser National Park in the Indonesian province of Aceh is the last protected refuge of the Sumatran orangutan. With financial support from The Walt Disney Fund, Gary Fink, and the Christensen Fund, and despite severe political turmoil in the region, Carel van Schaik and Elizabeth Fox focused on this subspecies' conservation. Orangutans have been documented mainly at low and mid-elevations. Their distribution at higher elevations is still poorly documented and is of considerable scientific and conservation interest. Fox aims to in-

crease training of Acehnese junior scientists in the scientific method, strengthen links between orangutan research sites with comparative ecological studies, and identify locations for orangutan conservation.

This was the first year of a formal WCS-Papua New Guinea program, though program coordinators Debra Wright and Andrew Mack have worked in PNG since the late 1980s with WCS support. The program focused on the 1,080-square-mile Crater Mountain Wildlife Management Area, a globally significant site of biodiversity and endemism. Our local partner, the Research and Conservation Foundation (RCF), oversees an innovative conservation program, while WCS-PNG focuses on research. This year, Wright and Mack re-censused plant plots. New data on tree turnover dynamics may have important implications for forestry in New Guinea. They also developed techniques for studying cassowaries, a critical landscape species.

Sponsored by the Christensen Fund, WCS-PNG taught a month-long field course to local students, took trainees on a field survey to New Britain, and supported research projects on palm cockatoos, birds of paradise, freshwater invertebrates, long-beaked echidnas, and rattan (an alternate non-timber forest product).

WCS Research Fellows Leo Salas and Suzette Stephens concluded their fieldwork with New Guinea's endemic arboreal marsupials at Mt. Stolle, which has some of the highest mammalian diversity in Australasia.

Rapid development has placed enormous stress on the landscape of Sarawak, Malaysia. To confront this threat, Elizabeth Bennett, with the assistance of Michael Meredith and funding from Edith and John Newberry, is working with the Sarawak government to implement the Master Plan for Wildlife in Sarawak. Efforts focused on conserving wildlife across the multi-habitat forest by assisting the government to gazette new protected areas and to control hunting in surrounding production forests, as well as training government wildlife staff. Bennett also oversaw a number of related projects, including research on the effects of fire

TO SAVE LANDSCAPES, WCS FOCUSES ON SPECIES THAT RANGE OVER VAST AREAS

on wildlife, impacts of logging and hunting on landscape ecology, and ecology and conservation management of three landscape species: flying foxes, edible-nest swiftlets, and, in Peninsular Malaysia, tigers. The tiger survey and management project is run by Ruth K. Laidlaw.

WCS opened its first site-based conservation project in Khao Yai, Thailand's oldest and most famous national park. This large forest is an important habitat for elephants and tigers. Habitat viability, however, is seriously compromised by illegal human activities. The project was unveiled in March by Royal Forest Department Deputy Director-General Wattana Kaewkamnerd and U.S. Ambassador to Thailand Richard E. Hecklinger. This project seeks to reduce the illegal hunting and tree-cutting that threaten the dwindling tiger and elephant populations. Tony Lynam, working with the Royal Forestry Department, proposed a ranger-training program, funded in part by the Texaco Foundation, and monitored tigers

and other indicator species in the park.

Hkakaborazi National Park in northern Myanmar contains some of the richest and oldest floral and faunal communities in Indochina. It supports increasingly rare and little studied Sino-Himalayan wildlife such as takin, musk deer, and red panda. Supported by the Cline Family Foundation, Alan Rabinowitz, U Saw Tun Khaing, and U Than Myint, together with participants from the Ministry of Forestry, made an expedition into the park to collect critical biological and socioeconomic data to help prepare a management plan. The WCS Myanmar Program, with technical oversight from Tony Lynam, completed the first-ever intensive large mammal/tiger survey at six sites. Plans are to complete tiger surveys at the remaining sites and use the information to develop a National Tiger Action Plan. Tiger densities were found to be much lower than expected on the basis of habitat availability, with only one of the sites showing evidence of tigers. Country Coordinator U Saw Tun

Khaing evaluated the status of protected areas. Training Coordinator U Than Myint conducted workshops for the junior staff of the Nature and Wildlife Conservation Division of the Forest Department.

Steven Platt surveyed the critically endangered Siamese crocodile in Vietnam, and initiated work on similar surveys in Cambodia, which may harbor some of the last remaining populations of this species. Platt also evaluated the Burmese star tortoise in Myanmar and, with the Bronx Zoo Herpetology Department, worked with the Myanmar Forestry Department to initiate a conservation effort for this reptile.

Boeng Tonle Sap (Great Lake) of Cambodia is one of the world's largest floodplain lakes. Its annual flood cycle drives the country's rice agricultural system and its flooded forest supports the largest freshwater fishery in Southeast Asia. Cambodia Program Coordinator Colin Poole made the wetlands around the Tonle Sap in central Cambodia a focus of landscape conserva-



Right: In Nicaragua, researcher Cynthia Lagueux and Field Vet Sharon Deem draw blood from a green turtle to assess the population's health. **Opposite:** WCS scientists visited the Jason Islands in the south Atlantic, home to a huge black-browed albatross colony (top) and rockhopper penguins (bottom).



tion. With support from Eleanor Briggs, the project began with wildlife surveys that confirmed the largest world populations of at least three globally threatened waterbirds: Bengal florican, greater adjutant, and spot-billed pelican. The Cambodian Program ran a series of training projects to build local capacity. WCS also collaborated with the WWF and TRAFFIC to sponsor the first regional conference on turtle trade and conservation in Asia. Held in Cambodia and including participants from 16 countries, the meeting represented a significant step toward addressing the critical impact of commercial trade on Asian turtle populations.

The forests of the Western Ghats are arguably the most important area for biodiversity conservation on the Indian subcontinent. Working in four protected areas, Ullas Karanth and his colleagues in local NGOs and government departments continued the Karnataka Tiger Conservation Project, an integrated conservation management and

training program. Supported by the Exxon Mobil-funded National Fish and Wildlife Foundation/Save the Tiger Fund and Mr. and Mrs. Gary L. Fink, the project seeks to develop skills and capacity in the forest department, enabling the staff to protect this string of reserves across the western boundary of the State of Karnataka. This work is complemented by Karanth's long-term prey monitoring, public outreach, and education efforts. Other WCS supported staff in the Western Ghats included small grant recipients Savitha Krishna, Nandini Rajamani, Manjunath Hegde, and H.S. Sushma and research on amphibians, flying squirrels, butterflies, and primates.

The eastern steppes of Mongolia represent an unspoiled grassland and unrivaled opportunity to protect and manage a whole ecosystem. At least one million Mongolian gazelles roam the steppes, sometimes in herds numbering 50,000 or more, but they face an uncertain future. Beginning with

George Schaller's pioneering efforts in collaboration with the Mongolian Academy of Sciences, WCS staff have studied the gazelles' population dynamics and movements to determine their needs. Graduate student Kirk Olson, working with B. Lhagvasuren and Schaller, began radio-collaring to track the species' migration.

The forests of the Russian Far East are among the last refuges of the Amur tiger and the extremely rare Amur leopard. Despite the Russian government's recent abolition of the Committee for Environmental Protection—a move viewed as a setback for conservation—Dale Miquelle and his colleagues continued to work on the conservation of tigers, leopards, black and brown bears, and ungulates in this critical landscape. WCS spearheaded the formation of a new protected area to provide a secure corridor linking coastal tigers in southern Khabarovsk with a population inland. Plans are under way to create a transboundary protected area with China's Heilongjiang and Jilin provinces to manage large carnivores on a multinational level. Radio-collar data collected by the Hornocker Wildlife Institute's John Goodrich indicated that nearly 45 percent of tigers collared have been lost to poaching, leading to new efforts to restrict road-building and to work with local organizations to manage hunting leases for wildlife conservation. Our program in the Russian Far East/northeastern China will be strengthened as the Hornocker Wildlife Institute becomes part of WCS.

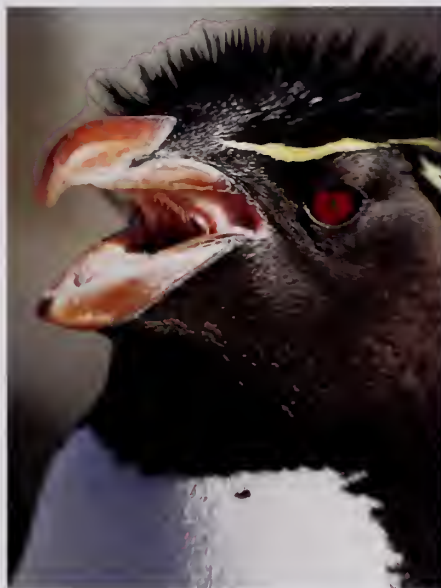
Established in 1992, largely through the efforts of WCS Director for Science George Schaller, Chang Tang Nature Reserve in northern Tibet contains the chiru antelope. Critically threatened, the chiru is the source of highly prized but illegal *shahtoosh* wool. In October, Schaller took part in the International Workshop on Conservation and Control of Trade in Tibetan Antelope in Xining, China. The event brought together enforcement people from France, Italy, China, Nepal, and India and urged China's State Forestry Administration to produce a comprehensive anti-poaching and anti-smuggling plan in coordination with the



Public Security, Customs, and State Environmental Protection agency and others.

According to John Thorbjarnarson's survey of Chinese alligators, funded by the Walt Disney Company Foundation, the species is on the brink of extinction in the wild. Working with the Anhui Province Forestry Department and East China Normal University, he surveyed the remaining range and found evidence of 130 alligators. Habitat loss in the lower Yangtze is causing the population to decline at a rate of 5 percent per year. Working with Chinese authorities, Thorbjarnarson examined plans to establish new populations in protected areas by releasing captive-bred alligators.

WCS is in the forefront of biodiversity conservation efforts in North Korea, as that country gradually expands its international contacts. Will Duckworth launched a three-year project to develop a protected-area management plan for Mount Myohyang Nature Park. In addition to its natural beauty and cultural significance to the Korean people, Mount Myohyang has populations of the threatened Asiatic black bear, musk deer, and long-tailed goral. WCS is the first



international conservation organization to work in North Korea and welcomes the opportunity to assist the government.

Latin America

Latin America hosts a wide variety of landscape species, ranging from jaguar, spectacled bear, tapir, and giant otter to mealy parrot and harpy eagle. These species inhabit

diverse landscapes, including high mountains, cloud forest, Amazonian rain forest, and vast tropical dry forests. It harbors one of the world's least known yet largest temperate rain forests and extensive areas of open steppe and desert. Penguins and other sea birds, as well as diverse sea mammals, qualify as seascape species for the region's coastal areas. WCS's history in the region dates to the early 1900s and gives us an unparalleled perspective and voice on the region's biodiversity and its conservation.

The new living landscapes program focused on two sites: the northwest Bolivian Andes around Madidi National Park, and the Ecuadorean Amazon around Yasuni National Park. These projects received major support from the U.S. Agency for International Development and the Robert W. Wilson Foundation.

The Latin American program spearheaded two hemispheric initiatives: Following the jaguar conservation workshop in Mexico, co-organized by WCS and the Universidad Nacional Autónoma de México in 1998, and with major funding from Jaguar Cars North America, we established a con-



servation program for this classic landscape species from the southwestern U.S. to northern Argentina. Implementation of this program is guided by a team of international jaguar experts including Alan Rabinowitz, Howard Quigley, Rafael Hoogesteijn, Marcelo Aranda, Peter Crawshaw, Jr., and Andrew Taber. We also started to put into place the Ecological Corridor of the Americas, one of the most far reaching and visionary initiatives in international conservation. It will create a conservation corridor down the mountain backbone of the Americas, from Alaska to Tierra del Fuego. The greenway, which will take decades to consolidate, is taking shape under leadership by Mario Boza in Costa Rica, with key support from Felicity Arengo in New York and Archie Carr in Florida. Links are being built to the Wildlands and Yukon to Yellowstone initiatives in North America and to the WCS initiated Mesoamerican Biological Corridor, or Paseo Pantera, in Central America.

Political support throughout the Americas has been remarkable.

Sixty-six projects are under way in 15 Latin America countries. They span 11 of the 14 major biomes in the region. In Argentina, our efforts along coastal Patagonia continued with guidance by Graham Harris, with support from Mr. and Mrs. Coleman P. Burke, the Joan O. L. Tweedy Fund for Argentina, and the Liz Claiborne-Art Ortenberg Foundation. Our outstanding team of Argentinean conservation biologists—Claudio Campagna, Pablo Yorio, and Flavio Quintana—continued to study seabirds and sea mammals. Threats to this unique system are increasing, as insufficiently controlled commercial fishing, particularly of hake, decimate fish populations. This is one area, among several in Latin America, in which our Marine Program under Ellen Pikitch is becoming engaged.

In January, William Conway, Andrew Taber, and Graham Harris visited the Jason

Islands, home to a huge black-browed albatross colony. With support from Robert W. Kean Jr., they explored the possibilities of a research program there to expand our scientific influence across the southwest Atlantic. An important contribution to world conservation came out of this program with the publication of a breeding bird atlas for Argentina's Patagonian coastline.

Conservation and research also expanded in the dry steppe of Patagonia on guanacos, carnivores, and rheas under the leadership of Andrés Novaro and Ricardo Baldi. In the subantarctic rain forest, conservation research began on Andean deer, led by Alejandro Vila. These efforts have been supported by the Turner Foundation and the Turner Endangered Species Fund. Launching the Corridor of the Americas, WCS and the Government of Salta Province, in Argentina's northwest, brought together government, conservation organizations, and scientists to begin local corridor planning.

WCS WORKS TO CONSERVE THE BIODIVERSITY IN ECOSYSTEMS AND LANDSCAPES

As a result, a new 72-mile key linkage reserve was established. This effort was led by Mario Boza and Francisco Lopez, and culminated in WCS signing a memorandum of understanding with the Governor of Salta, Juan Carlos Romero, to work together to consolidate the corridor.

Andrew Taber made a reconnaissance trip to southern Chile to explore ways in which WCS can contribute to the conservation of the temperate rain forests and huge fjord system. Farther north, Felicity Arengo worked with local scientists and government agencies on research, monitoring, and conservation of flamingos—the key landscape species for the wetland system of the high Andean plateau of Chile, Argentina, Bolivia, and Peru.

The U.S. Agency for International Development renewed their support for a fourth phase of the Gran Chaco program in Bolivia, where we work closely with our Izoceño Indian partners. It is one of the largest protected areas in the Americas and the largest local community-managed national park anywhere. The project is led by Michael Painter, who became involved in developing strategies and national policies to mitigate the environmental impacts of hydrocarbon exploration, transportation, and extraction. The wildlife research and management team headed by Andy Noss made great strides in understanding the ecology and management needs of the Chaco's threatened and game species. Indian parabiologists and Bolivian biologists well trained by Noss made important contributions to the South American Wildlife Management Conference held in Paraguay.

Support to our partners at Bolivia's Noel Kempf Mercado National History Museum continued under the leadership of Damian Rumiz and funding, jointly with the Missouri Botanical Garden, from the Liz Claiborne-Art Ortenberg Foundation. Lucho Pacheco and Alejandro Roldan continued their conservation research on little-known large Andean mammals and undergraduate training in the cloud forest of the Cotopata National Park near La Paz. This work is being supported in part by the John

D. and Catherine T. MacArthur Foundation.

Our project in the northwest Bolivian Andes in and around Madidi National Park made major advances with new support from USAID and the Robert W. Wilson Foundation. Here, we work closely with key partners CARE and the La Paz-based Institute of Ecology. This park may contain more bird species than any other protected area in the world, and hosts such landscape species as spectacled bears, Andean deer, white-lipped peccary, and jaguars. Bolivian biologist Lilian Painter and Robert Wallace completed extensive wildlife surveys and are supervising research on spectacled bears by Susanna Paisley and David Garshelis, one of the world's foremost experts on bears. This program produced a detailed threat analysis for the Madidi landscape. The biopolitical skills of Painter and Wallace forged much stronger ties among government, conservation, and community groups. Also, Painter worked closely with Tacana Indians to help them promote their territorial claims to the northeast part of the national park as well as in the management of their wildlife resources. This is key to protecting this flank of the park from predatory development.

In Brazil, conservation of the flooded forest of the Mamirauá, Amanã, do Jaú protected area complex—the world's largest protected block of tropical rainforest—continued under the leadership of Márcio Ayres. Ayres is one of Latin America's most influential conservation scientists. This project was praised by Brazilian President Cardoso as the finest conservation program in the Brazilian Amazon. The WCS reptile conservation program, guided by John Thorbjarnarson, continued its work through Ronis Da Silveira on the ecology and management of black caiman in the flooded forests, and with Richard Vogt, of INPA in Manaus, on development of a turtle management plan for Mamirauá.

Meanwhile, Ayres turned his attention to the Brazilian Pantanal, home to waterbirds, marsh deer, jaguars, caiman, and many other species. Working closely with Brazilian conservationist and WCS Advisor Israel Klabin, we established a new research station, supported by the Saddle Foundation, the Derald H. Ruttenberg Foundation, and Edith and John Newberry. Our activities are focused at better understanding the region's ecology, particularly of landscape

Below: Márcio Ayres (with white uakari) works to conserve hoatzins (opposite) and other Amazonian species that live in the world's largest protected block of tropical rain forest.



species, and developing biodiversity-friendly management practices by working with cattle ranchers, the dominant land users.

In Peru, Patricia Majluf's monitoring of sea mammals, guano birds, and penguin colonies at Punta San Juan continued, following the dramatic El Niño event a couple of years ago. Majluf is developing broader initiatives for conservation of the extraordinarily rich marine fauna along the Peruvian coastline, involving government, partner conservation organizations, and local communities. Lisa Naughton worked with local communities on wildlife management in the Tambopata Reserve Zone of Amazonian Peru. In Loreto, in the northeastern Peruvian Amazon, Richard Bodmer developed a sophisticated science- and community-based management program for peccaries, deer, primates, and tapir. Most of these species are ecologically important on the landscape

scale. Catherine Sahley continued to work with the communities of the high plateau of Arequipa on community-based management of vicuña, in addition to training local university students in wildlife management.

In Ecuador, Robert Williams was joined by Jeff Jorgenson, who is an experienced wildlife biologist with many years of work in Colombia. Here, in the greater Yasuní area and adjoining Huaorani Indian territory is one of our living landscape sites funded by USAID and the Robert W. Wilson Foundation. We worked with partners CARE, EcoCiencia, the Catholic University, the Huaorani Indigenous People's organization ONHAE, and other groups. Landscape species include jaguars, white-lipped peccaries, giant otters, and harpy eagles. We face the difficult task of building sustainable conservation in a region of intense oil extraction, and where efforts must focus on strengthen-

ing the local indigenous community. WCS provided technical assistance to the Biological Monitoring and Low-Impact Forestry components of the Sustainable Use of Biological Resources (SUBIR) project, principally around the Cotacachi Cayapas Reserve in northwestern Ecuador.

Despite unrest in Colombia, research and training on vertebrate ecology, natural habitat restoration, and other topics relevant to landscape ecology at the Center for Excellence in Conservation in the Andes continued under the direction of Gustavo Kattan and Carolina Murcia. They also worked part-time with the Colombian Park Service to develop strategies and priorities for conservation research. WCS helped local governments build reserve networks in the highly fragmented Viejo Caldas area under the leadership of María Elfi Cháves. Support from the John D. and Catherine T. MacArthur Foundation for a tropical Andes research program will help expand and connect projects from Venezuela to Colombia to Bolivia. Researchers will look at ecological questions and test the landscape-species approach to develop scientifically grounded conservation.

In Venezuela, Jose Ochoa and our Venezuelan partner ACOANA worked in the 11,400-mile Caura River basin in consort with the local Yekwana Indians, other groups, and the government. ACOANA maintains the Dedemai research station, which WCS established about a decade ago. With some of our other local partners, they received significant financial support from the Venezuelan government and the Polar Foundation to design and develop a conservation and management plan for the Caura. Conrad Vispo, in partnership with the La Salle Foundation, studied the ecology and use of fish and wildlife with communities also in the Caura watershed. Ochoa, with Bruce Miller from Belize, applied a computerized sonic signature method to survey bats. Our Venezuelan counterpart, Provita, maintained the yellow-shouldered amazon parrot program on Margarita Island. Isaac Goldstein continued research on the ecology of spectacled bears, a key landscape species

In North America, WCS studied the brown bear (below), impacts of predators on moose (opposite, bottom), and red knot ecology (opposite, top, Sarah Ward releases a radio-tagged red knot).



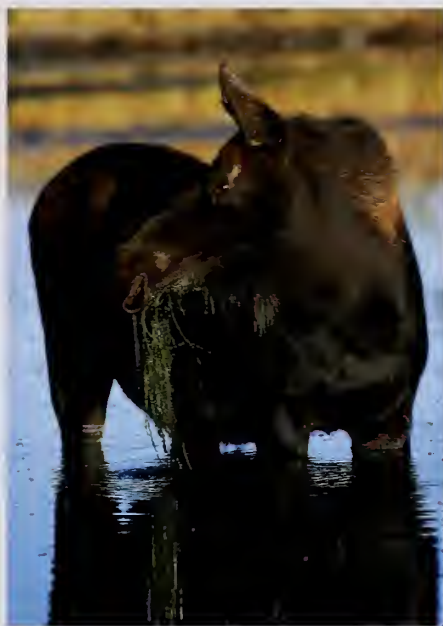
in the Andes cloud forest. Our small grants program, administered by NGO EcoNatura, provided crucial funding for three students.

In Nicaragua, Colleen McCann, Bronx Zoo Associate Curator of Primatology, worked with the local conservation group COCIBOLCA to explore how best to conserve howler monkeys in shade coffee plantations. Shade coffee is important as an increasingly dominant habitat type in Central America. Under appropriate management, the habitat may help protect significant biodiversity. Cynthia Lageux and Cathi Campbell continued their research, training, and community work on marine turtles in Miskitu communities along the Caribbean coast. They initiated nesting beach surveys and protection, reducing the effects of poachers by 50 percent.

On Honduras's Bay Islands and coast, Jim Barborak and Karla Suárez developed management plans for a series of small reserves, which provide crucial linkages in the Mesoamerican Biological Corridor.

Under the leadership of Roan McNab, our Guatemalan Program continued to expand. After much negotiation, and with key support from WCS, the Uaxactún community was granted a forest concession by the Guatemalan government in the Maya Biosphere Reserve. Through his tireless work with the local people, McNab is building one of the most impressive community-based conservation efforts in Central America. Robin Bjork continued her innovative research on one of the key landscape species, the mealy parrot. She documented the species' resources across the huge areas required to maintain populations. Guatemala's Peten was threatened by colonization, major hydrocarbon development, and massive forest fires. WCS is the most active international conservation organization in the most intact part of the biosphere reserve.

Bruce and Carolyn Miller continued their work with the Government of Belize and other organizations to develop and implement a biodiversity monitoring program. Protocols they developed are being applied generally across the Maya forest of Belize, Guatemala, and Mexico. At their Gallon



Jug research station, they designed and tested a survey and monitoring program for jaguars, using cameras and track-measuring protocols as part of the WCS Jaguar Conservation Program. After testing, these methods will be applied in surveys of this species throughout its range in the Americas.

North America

Closer to home, the North America program is working in one of the most spectacular landscapes in the United States: the Greater Yellowstone Ecosystem. WCS faces the challenge of conservation in a complex region with overlapping management regimes amid escalating pressures from ranch-

ing, logging, and human development. In conjunction with wolf-reintroduction efforts, Toni Ruth documented the impact of wolf recovery on mountain lions in remote northern Yellowstone. In southern Yellowstone and the Tetons, Joel Berger explored the impacts of grizzlies and wolves on moose and other prey. Berger also partnered with Carol Cunningham and others to investigate the incidence of brucellosis disease in bison and its potential transmission to cattle. Their work was generously supported by the Charles Engelhard Foundation.

In the Pacific West, a suite of WCS landscape projects are united by a common theme: the search for effective restoration schemes that foster healthy wildlife communities and meet the needs of human communities. Decades of fire suppression have transformed the ponderosa pine forests and crowded out many native species. Steve Zack centered his activities on identifying the bird species that best reflect successful restoration of ecosystems and investigated how those species respond to innovative forest management. Zack also documented the response of bird communities to prescriptive grazing management, with the potential to affect ranchers' land-use decisions. In California's Sacramento Valley, Claire Kremen investigated the disappearance of native pollinators—a growing problem in agro-ecosystems. Kremen explored an innovative conservation angle: using watermelon crops as a model to document the impor-

THE IMPACT OF HUMAN ACTIVITIES ON ANIMALS IS IMPORTANT TO THEIR CONSERVATION

tance of native bees. Her findings about native pollinators and the wildlands they require will help inform farming practices as well as create a new argument for conservation of wildlands.

Farther north, in Alaska's Chilkat Bald Eagle Preserve, Angie Hodgson and local communities searched for ways to promote a healthy ecosystem in the face of increasing pressures from ecotourism and expanding human settlement. As a top predator that bridges both aquatic and terrestrial habitats, the bald eagle can serve as an important indicator of the health of our ecosystems and the success of management practices.

John Weaver studied another landscape species in Alaska—the brown bear. Using his innovative scent-post rubbing technique, Weaver researched bear population densities in Alaska and British Columbia. Weaver also identified wildlife corridors, key bear habitat, and critical salmon-spawning streams, and he provided critical information on the lynx, another landscape species. The results of Weaver's surveys helped the U.S. Fish and Wildlife Service decide to list the Canada lynx as a threatened species in the lower 48 states. Weaver worked in one of the greatest wild places in

North America: the Arctic National Wildlife Refuge. Development and oil extraction threaten to despoil a landscape so rich in wildlife that it is often dubbed the "American Serengeti."

Almost half of the six-million-acre forested landscape of New York's Adirondack Park is privately owned. Generous support from The Ford Foundation allowed WCS to engage in community-based conservation there. This year, the first of a network of Adirondack Community Information Centers opened in the town of Inlet. These interpretive centers offer information to visitors and residents on local natural attributes, recreational opportunities, historical attractions, and park management. Program Coordinator Heidi Kretser helped to open this center and spearheaded numerous other Adirondack Communities and Conservation Program projects.

Also in the Adirondacks, Jerry Jenkins continued to study acid rain and forest regeneration. Jenkins, along with GIS Specialist Andy Keal and others, is developing an innovative atlas of the Adirondacks to be printed next year. In a parallel project funded by the Geraldine R. Dodge Foundation, Justina Ray and Matt Gompfer explored

the coyote's potential to fill the niche of the missing wolf and potentially to outcompete other smaller predators.

Even closer to New York City headquarters, the Metropolitan Conservation Alliance (MCA) expanded its activities and scope thanks especially to the continued support of the Doris Duke Charitable Foundation, the Surdna Foundation, and the New York City Council. MCA continued to emphasize wildlife conservation in regional landscapes, while recognizing that our efforts must include the human communities and the economic and recreational activities that sustain them. Not surprisingly, protecting wildlife and wildlife habitats in the New York metropolitan region, especially in the face of increasing pressure for commercial and suburban development, is not easy.

MCA sponsored a seminar in leadership training and land-use law for communities around the Great Swamp in an effort to provide the tools necessary to protect this important ecosystem. MCA also initiated the Croton-Highlands Corridor project in Westchester and Putnam counties, where biological information will be used in planning and development. MCA staff advised the town of Warwick, New York, in developing an Open Space Plan. This effort clearly indicated the potential for maintaining ecologically compatible and economically viable agriculture in the metropolitan region, an issue MCA further explored as a co-sponsor of an international Agriculture Initiative held at the Glynwood Center in Cold Spring, New York. In addition, MCA co-sponsored, with the Center for Biodiversity and Conservation of the American Museum of Natural History, "Nature in Fragments," a symposium dedicated to understanding the ecological effects of fragmentation on biological diversity, one of the most important issues in conservation.

In one of the world's grandest landscapes, WCS researcher Larry Niles studied a shorebird that migrates 20,000 miles annually—from the Arctic to Argentina. The red knot's ecology and conservation is closely tied to dwindling horseshoe crab populations in Delaware Bay, where the

Right: In the WCS marine program, researcher Beth Babcock helped Patricia Majluf analyze the impact of artisanal fisheries on penguins and dolphins (opposite, a dusky dolphin) along the coast of Peru.



birds rely on crab eggs as a critical food resource during spring stopovers. An international team of biologists, funded by the Geraldine R. Dodge Foundation, located nearly 54,000 red knots, roughly 70 percent of the New World population, in one small bay in southern Patagonia. This finding will be added to results of the migratory bird's status in Delaware and Hudson bays to help make decisions about allowable harvests of horseshoe crabs.

Marine Conservation

The first year of the twenty-first century was also the first full year of operation for the Marine Conservation Program. Core efforts centered on fisheries, coral, sea turtle, and marine mammal conservation. WCS co-hosted the first International Pelagic Shark Workshop, held in Monterey, California, in February. The workshop attracted scientists from 15 countries and identified conservation priorities for blue, mako, and other sharks of the open ocean. With generous support from Edith and John Newberry, Program Director Ellen Pikitch led a team of scientists in a preliminary investigation of some of these shark species at the WCS Marine Research Station at Glovers Reef Atoll, in Belize. The survey confirmed that Glovers Reef is a nursery ground for lemon sharks and an important habitat for other species, including nurse, Caribbean reef, and Caribbean sharpnose sharks.

Elizabeth Babcock was named Constantine S. Niarchos Fellow in Marine Conservation, a two-year position established by The Stavros S. Niarchos Foundation to help support our global conservation efforts. Babcock launched her Fellowship by presenting an analysis of recreational shark fisheries in the Atlantic Ocean at the International Pelagic Shark Workshop. She and Patricia Majluf analyzed the impact of coastal artisanal fisheries on penguin and dolphin populations in Peru. Babcock also represented WCS at meetings of the International Commission for the Conservation of Atlantic Tunas, where she contributed to population assessments of Atlantic swordfish and bluefin tuna.



Dan Erickson, director of the Pacific Fisheries Program, concluded the first field trials of an artificial bait designed to catch target species and repel bycatch species. The bait appears to be highly species-selective. This innovative approach, funded in part by the Alaska Fisheries Development Foundation Inc., is an encouraging development in the challenging search for applied, rather than regulatory, solutions to the bycatch problems of longline fisheries. It has the potential to change the nature of the debate about the use of longlines. Erickson also launched a pilot program for conservation of green sturgeon on Oregon's Rogue River. Almost nothing is known of the species' biology and ecology, yet sturgeons as a group are among the world's most beleaguered fish populations. Supported by the David and Lucile Packard Foundation, this project is part of a larger sturgeon conservation campaign that WCS will launch in early 2001. Elizabeth Lauck, assistant director of Marine Program, was appointed to the U.S. government's Advisory Panel for Atlantic Highly Migratory Species and represented WCS on the Packard Foundation's Western Pacific Capacity Building Working Group.

Ellen Pikitch received a prestigious Pew Fellowship in Marine Conservation to further develop the WCS seascape concept. Pikitch will use her fellowship to help develop new ways for scientists, fishermen, and the public to start thinking about oceans as biologically interdependent systems that need careful protection in certain areas to thrive. She will focus on the contrasts between the New England seascape, where fisheries are overexploited and highly regulated, and the Madagascar seascape, about which much less is known.

Glovers Reef Marine Research Station is the headquarters for our Caribbean Seascape initiative. Charles Acosta documented the importance of conservation zones to protection of the atoll's spiny lobster population. Enric Sala conducted a survey of grouper resources during the annual spawning aggregation in January. His results showed that the Glovers Reef assemblage is only one-tenth the size it was in the 1970s. Equipped with this information, Sala and Station Manager Tom Bright gained the cooperation of local fishermen to take biological measurements of the fish they caught, and subsequently helped them determine

Right: The work of Alan Rabinowitz on jaguars (opposite) is one of three model projects incorporated under WCS's new Global Carnivore Program.



when to stop fishing for the season so that the reproductive stock could be protected and controlled harvests could take place in the future. The Marine Program bid farewell to Glovers Reef Marine Research Station Managers Bright and his wife, Cindy Liles. They made a major contribution to the continued success of the station, working tirelessly to protect our conservation gains at Glovers Reef.

Tim McClanahan, with support from Edith and John Newberry, continued a series of algal removal experiments to illuminate the causes of an algal overgrowth on the corals of Glovers Reef. In the Indian Ocean, his annual monitoring of Kenya's coral reefs showed poor recovery after the 1998 mortality, with the exception of one shallow-water reef in Kanamai. His work also revealed wide-scale disturbance to coral reefs across the western Indian Ocean and the world due to El Niño, with many areas experiencing more than 90 percent mortality.

WCS scientists helped the United States government develop the first recovery plan for North Atlantic swordfish. Through a combination of scientific analyses and policy work, WCS helped identify management options to rebuild the North Atlantic

swordfish population to healthy levels over the next ten years.

Global Carnivore Program

Carnivores are some of the most beautiful, powerful, wide-ranging, and dangerous animals on Earth. At the same time, they are some of the most controversial and threatened species in the world. Throughout human history, most large carnivores have been intricately woven into the fabrics of cultures, to be both worshipped and feared. Now, large carnivores are struggling to survive human onslaught.

The Global Carnivore Program was established in 1998 to advance our knowledge of carnivore biology while saving these species from extinction. WCS has the most extensive and diverse carnivore field program in the world. But creation of new laws and new protected areas has not been enough to stem the decline of wild carnivore populations. Factors such as habitat fragmentation, encroachment, and hunting have all contributed toward increasing conflicts between large carnivores and people. This will likely worsen in the future.

Most large carnivore conservation involves single species within limited areas. To

more effectively conserve large carnivores, we need to take research and conservation beyond the single-species approach to a wildlife-community level that operates within the human-dominated landscape. We need to better understand the ecology of large carnivore guilds, their influence on their ecological systems, and the actions necessary to allow humans and large carnivores to coexist. We also need to compare information and lessons learned from carnivores on a global level so that time, money, and effort are more effectively utilized.

Few conservation efforts for large carnivores have tried to operate throughout a large landscape in an integrated manner. During the first year, with generous support from Mr. and Mrs. J. Michael Cline and Jaguar Cars North America, three model projects were incorporated under the Global Carnivore Program: the tiger in Myanmar, the jaguar throughout the Americas, and the mountain lion in the Yellowstone ecosystem.

Science Resource Center

Department Director George Amato began to reorganize scientific programs to build on department strengths and increase synergy between International Conservation and the WCS wildlife centers. Howard Rosenbaum joined the staff to help direct the conservation genetics program while continuing his genetics research on cetaceans. Rosenbaum was selected as an advisor to the International Whaling Commission's International Meeting, at which he presented data on the critically endangered right whale.

The Center's wildlife forensics program assisted U.S. Fish & Wildlife and Department of Agriculture law enforcement officials during investigations into illegal trade in wildlife products, including bushmeat from Africa and gazelle skins from Asia. Three graduate students completed their doctoral dissertations through the joint WCS/AMNH Conservation Genetics Program on lemur genetics, conservation of sturgeon, and identification of barking deer distributions in understudied areas of Asia. Formal centers in population biology and molecular ecology were also established.

Africa

CAMEROON

1. Conservation and community participation in Banyang-Mbo Forest Reserve. David Hoyle, Bryan Curran, Roger Fotso, David Nzouango, Andrew Inyang, Dominic Ngwesse, Christine Tataw, Lewis Nkambi
2. Biological inventory of the Banyang-Mbo Forest Reserve. Roger Fotso, Martha Betchem, Mercy Nambu, and Vincent Eyabi
3. Survey of Mbam-Djerem National Park. Fiona Maisels, Roger Fotso, David Hoyle

CENTRAL AFRICAN REPUBLIC

4. Dzanga forest elephant demographics and social dynamics (WCS/USFWS). Andrea Turkalo, Peter Walsh
5. Research on the use of elephant infrasound as a method of censusing in forests. Steve Gulick, Katy Payne, Andrea Turkalo

CONGO REPUBLIC

6. Nouabalé-Ndoki Project (WCS/USAID/GEF). Bryan Curran, Djoni Bourges, Jerome Mokoko
7. Nouabalé-Ndoki zone management (WCS/USAID/GEF). Paul Elkan, Sarah Elkan
8. Forest elephant migration and ecology (WCS/USFWS/Save the Elephants). Steve Blake, William Karesh
9. Biological surveys and monitoring in Nouabalé-Ndoki National Park (WCS/GEF). Fiona Maisels, Steve Blake, Paul Elkan
10. Bongo ecology and use of forest clearings (WCS/Busch Gardens). Paul Elkan
11. Ecology of 'bais' and their importance for wildlife. Sarah Elkan
12. Schools education programme. Sarah Elkan
13. Protection for important elephant populations in Congo (WCS/USFWS). Bryan Curran, Steve Blake
14. Mbeli bai gorilla social dynamics and ecology (WCS/Busch Gardens). Richard Parnell
15. Conservation of Conkouati National Park. Bryan Curran, Fiona Maisels
16. Conservation of Lac Tele. Brian Curran

DEMOCRATIC REPUBLIC OF CONGO (formerly ZAIRE)

17. Ituri Forest Research and Training Center (CEFRECOP). Terese Hart, John Hart, Innocent Liengola
18. Large-mammal and human-impact surveys of the Okapi Wildlife Reserve. John Hart, Paulin Tshikaya
19. Impact of the civil war on bushmeat trade and elephant poaching (WCS/FWS). Jean Joseph

- Mapilanga and John Hart
20. Comparative forest dynamics. Terese Hart, Innocent Liengola, Makana Mekombo, Corneille Ewango
21. Community participation in Okapi Wildlife Reserve. Richard Tshombe, R. Mwinyihali
22. Effect of the civil war on the large mammal fauna of the Kahuzi Biega National Park. Omari Ilambu

EGYPT

23. The effects of overgrazing on the herpetofauna of the Sinai. Omar Attum

GABON

24. Research and training for management of Lopé Forest (WCS/ECOFAC). Lee White
25. Forest history and dynamics and their implications for management in Lopé Forest Reserve. Lee White
26. Mandrill ecology and ranging patterns (WCS/SEGC). Kate Abernethy, Lee White
27. Use of plant genetics to map forest refuges (WCS/CARPE). Nicole Muloko Ntoutoume
28. Ecology of forest buffalo in Lopé Reserve. Lisa Molloy, Kate Abernethy
29. Support to national NGOs. Lee White, Kate Abernethy

IVORY COAST

30. West African manatee conservation and education. Akoi Kouadio
31. The ecology of the crowned eagle

in Tai Forest. Suzanne Schultz

KENYA

32. Masai Mara working group. Helen Gichohi
33. Wildlife distribution and habitat use in the Kitengela corridor: Nairobi National Park and the Athi-Kapiti plains. Helen Gichohi
34. Natural resource economics in wildlife conservation. Albert Mwangi
35. Coral reef research and conservation. Tim McClanahan
36. Habitat rehabilitation of Amboseli wetlands. African Conservation Centre Staff
37. Ecological monitoring in Amboseli National Park. David Western
38. African Conservation Centre (ACC)—development of a national NGO. Helen Gichohi
39. Conservation of large carnivores in livestock areas. Laurence Frank
40. Population density and ecology of Tana River crested mangabey. Julie Wiecekowsky
41. Effects of habitat fragmentation on the Taita white-eye. Ronald Mulwa
42. Biodiversity of land molluscs in Arabuko-Sokoke Forest. Charles Lange
43. Conservation of Turner's eremomela. David Kiptoo Kosgey
44. The ecology of small antelopes in Arabuko-Sokoke Forest. Erustus Kanga

45. The effects of marine parks on local fisheries catches. Boaz Arara
46. Biodiversity survey of the Cheren-gani Hills. Joel Mwangi Gathua
47. A survey of hardwoods in the Kerita Indigenous Forest. David Kuria

MADAGASCAR

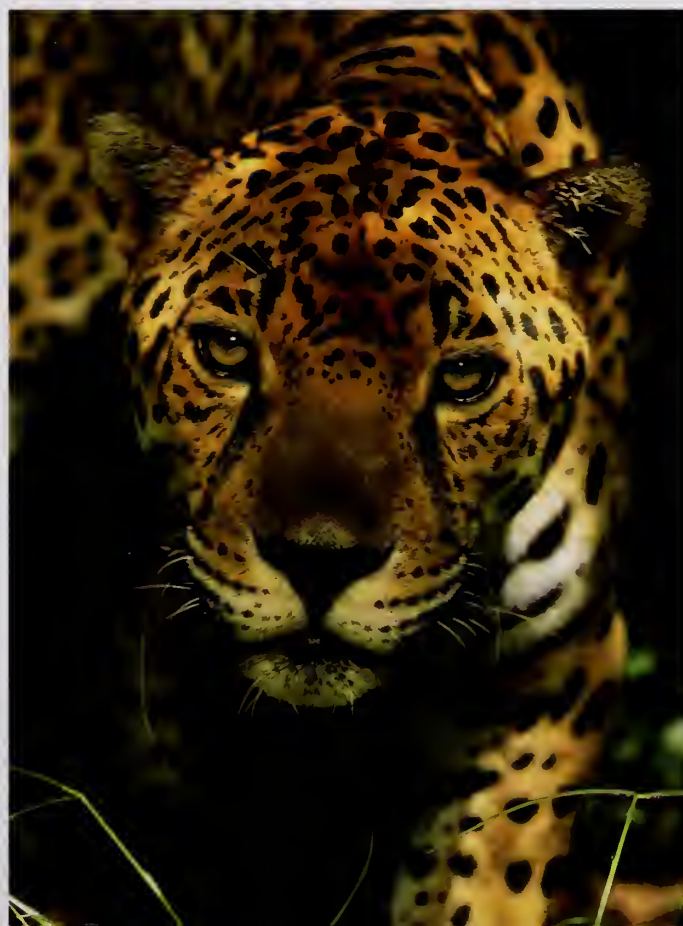
48. Masoala National Park management and ecotourism development (WCS/CARE/ANGAP/DEF/Peregrine Fund/Stanford CCB/US-AID). Matthew Hatchwell
49. Ecological monitoring at Masoala National Park. Claire Kremen
50. Distribution and inventory of insect taxa. Lanto Andriamampianina, Tiana Raharitsimba
51. Butterfly ranching (WCS/Masoala Project). Tiana Raharitsimba
52. Monitoring of diurnal lemurs at Masoala National Park. Marius Rakotondratsimba
53. Cetacean research and conservation in Antongil Bay (WCS/AMNH). Howard Rosenbaum, Yvette Razafindrakoto, George Amato, Rob DeSalle, Matthew Hatchwell
54. Marine mammal conservation in northwest Madagascar. Yvette Razafindrakoto
55. Bushpig densities and ecology on Nosy Mangaby and in Masoala National Park. Vonjy Andrianjakarivelo, Emilienne Razafindrakoto
56. Reptile inventory at Masoala National Park. Rosalie Razafindrasoa
57. Ecology and status of the flat-tailed tortoise in Kirindy Forest, west-central Madagascar (WCS/JWPT). John Behler, Quentin Bloxam, Herilala Randriamahazo
58. Veterinary assessment of the health status of captive and wild radiated and spider tortoises. Bonnie Raphael, John Behler
59. Effects of forest composition, disturbance, and fragmentation on the social behavior and feeding ecology of black and white ruffed lemurs. Jonah Ratsimbazafy
60. Humpback whale populations around Fort Dauphin. Justin Retenany
61. The effects of the fishing industry on dolphin populations around Fort Dauphin. Norbert Andrianarivelo
62. Habitat fragmentation and nest habitat selection by *Atelornis pit-toides*, an endangered ground roller. Jean C. Razafimahaimodison

MALI

63. Ecology of elephants in the Sahel. Anne Orlando, William Karesh

NIGERIA

64. Status of primates and forests in eastern Nigeria. John Oates



Wildlife Conservation Projects

65. Conservation of an isolated gorilla population in the Afi Mountains. Kelley McFarland, John Oates

RWANDA

66. Nyungwe forest conservation: ecotourism, education, inventory and monitoring. Michel Masozera, Felix Mulindahabi, Martin Sindikubwabo
67. Biological survey of the Nyungwe Forest Reserve. Michel Masozera, Alastair McNeilage, Andrew Plumptre, Innocent Liengola, Corneille Ewango, Terese Hart
68. Feeding ecology and ranging of chimpanzees at high altitudes. Michel Masozera
69. Ranging behavior of a group of 400 colobus monkeys. Felix Mulindahabi, Michel Masozera, Andrew Plumptre, Peter Fashing
70. Education program around Nyungwe Forest Reserve. Barakabuye Nsengiyumva, Michel Masozera
71. Support to Virunga National Parks staff for equipment. Andrew Plumptre, Amy Vedder

SOUTH AFRICA

72. Disease dynamics of bovine tuberculosis in African buffalo. Anna Jolles

TANZANIA

73. Biodiversity assessment and the development of professional capacity in Tanzanian national parks. David Moyer
74. The effect of poaching on elephant social systems, Tarangire. Charles Foley, Lara Foley
75. Cheetah survival and behavior in woodlands versus savanna habitats. Sarah Durant
76. Effects of tourism revenue-sharing on wildlife in Zanzibar. Karen Archibald
77. Loss of endemic tree species in montane forests of Tanzania. Norbert Cordeiro
78. Effects of sport-hunting on lions. Karyl Whitman
79. Professional training of conservation scientists. WCS Staff
80. Amphibian communities in forests. Alan Channing, Kim Howell
81. Conservation of the southern Tanzania highlands. Tim Davenport, David Moyer

UGANDA

82. Wetlands refugia for indigenous fishes. John Olowo, Lauren Chapman
83. Primate dispersal and conservation, Kibale Forest. William Olupot
84. Recovery of plant and animal communities in the Kibale Corridor. Colin Chapman, Lauren Chapman

85. Nationwide survey of chimpanzees in Uganda. Andrew Plumptre, Sam Mugume, Debby Cox
86. Phenology, seed dispersal and germination of selected tree species in the Budongo Forest Reserve. Andrew Plumptre
87. Research support to MSc. students in the Bwindi Impenetrable National Park. Alistair McNeilage
88. Radio-tracking of Nahan's francolin. Eric Sande
89. Diversity of amphibians in Lake Nabugabo. Mathias Behangana
90. Evaluation of community-based conservation initiatives. Arthur Mugisha
91. Conservation status of lakeshore wetland ecotones in Lake Victoria. Arthur Mugisha
92. Importance of edge effects in the conservation of fauna and flora in Bwindi Impenetrable National Park. William Olupot
93. Conservation of the forests of the Albertine Rift. Andrew Plumptre

ZAMBIA

94. Nyamaluma community-based training and land-use planning/ADMADE (WCS/NPWS/USAID). Dale Lewis
95. Status and ecology of the black-cheeked lovebird. Louise Warburton
96. Comprehensive monitoring systems for community-based wildlife conservation in Africa: Determinants of data quality. Andrew Lyons

ZIMBABWE

97. The ecology and deterrence of crop-raiding elephants. Ferrel Osborn

REGIONAL AFRICA

98. Central African Regional Program for the Environment (CARPE) (WCS/USAID/BSP/WWF/NASA/WRI/USPC/WL). Amy Vedder, Lisa Molloy, Lee White, Bryan Curran, Peter Walsh, Andrew Plumptre
99. Socio-economic assessments and local community participation in African forests. Bryan Curran
100. Regional training and inventory program in central African forests (WCS/USAID). Lee White, Peter Walsh
101. Development of elephant monitoring system in the Congo Basin for CITES. John Hart, Lee White, Peter Walsh, Rene Beyers
102. Trinational monitoring: Congo, CAR, Cameroon (WCS/WWF/USAID). Bryan Curran
103. Development of efficient methods for large mammal surveys (WCS/CARPE). Peter Walsh, Lee White
104. Post-graduate training and pro-

fessional development (WCS). Andrew Plumptre, Terese Hart, Claire Kremen, Kate Abernethy, Lee White, Matthew Hatchwell

105. Nutritional analyses of food composition for African mammals, birds, and reptiles. Ellen Dierenfeld, Andrew Plumptre, Jessica Rothman
106. Central African Republic to Gabon Megatransect. J. Michael Fay
107. Methods for studying crop-raiding impacts on local people. Kate Hill, Ferrel Osborn

Asia

CAMBODIA

108. Tiger survey and conservation techniques training program. Antony Lynam, Men Soriyun, Net Neath, Joe Walston
109. Large mammal surveys and field training in the Southern Parks Landscape and Samling forestry concession in Monduliri. Men Soriyun, Joe Walston
110. Large waterbird surveys, field training, and conservation awareness in the Tonle Sap Inundation Zone and Northern Plains Landscape. Hong Chamnan, Frederic Goes, Colin Poole
111. Forest bird surveys and field training in the Southern Parks Landscape and Samling forestry concession in Monduliri. Peter Davidson, Frederic Goes, Tan Setha
112. Herpetological surveys. Steven Platt, Bryan Stuart
113. Status and conservation of bats in and around Phnom Penh. Joe Walston
114. Management of Ang Trapeang Thmor Sarus Crane Reserve. Nhan Bunthou, Frederic Goes
115. Production of Khmer language field guides and training materials. Colin Poole

CHINA

116. Chang Tang (Tibet) wildlife surveys and reserve planning. George Schaller
117. Biodiversity conservation in the Himalayas of the southeastern Tibetan Autonomous Region. George Schaller, Tibetan Autonomous Region Forestry Department
118. Tibetan Forestry Department training. Endi Zhang, Tanya Tang
119. Monitoring tiger population in Heilongjiang Province. Endi Zhang, Dale Miquelle, Sun Boagang
120. Asia Conservation Communication Program. Endi Zhang, Tamara Krizek, Tanya Tang

121. Chinese alligator project. John Thorbjarnarson, Xiaoming Wang
122. Survey of the Chinese water deer. Endi Zhang, East China Normal University
123. Monitoring trade and use patterns of wildlife in Shanghai. Endi Zhang, Shanghai CITES Office
124. Habitat selection, evolution, and conservation of the crested ibis, *Nipponia nippon*, in China. Zhijun Ma

INDIA

125. India tiger surveys. Ullas Karanth, Samba Kumar, Jim Nichols
126. Ecology of the tiger in Panna, Central India. Neel Gogte, Raghu S. Chundawat, Ullas Karanth
127. Karnataka Tiger Conservation Project. Ullas Karanth, Praveen Bhargav, K.M. Chinnappa
128. Impact of forest fragmentation on hoolock gibbons in Barajan Reserve Forest, Assam. Kashmira Kakati
129. Status and ecology of an endangered hispid hare, *Caprolagus hispidus*, in Jaldapara Wildlife Sanctuary, West Bengal. Gopinathan Maheswaran
130. Resource utilization and niche separation in sympatric rainforest arboreal mammals. H.S. Sushma
131. Ecological study of sympatric hornbills and fruiting patterns in a tropical forest in Arunachal Pradesh, Northeast India. Aparajitha Datta
132. Ecology and conservation of endemic small carnivores in the tropical rain forests of the south-western Ghats. Divya Mudappa, Surya Addoor
133. Community ecology and conservation of amphibians in the tropical rain forests of Karnataka. Savitha Krishna
134. Binturong surveys in Northeast India (Tripura). Atul Gupta
135. Flying squirrel feeding ecology. Nandini Rajamani
136. Butterfly distribution in Western Ghats. Manjunath Hegde
137. Non-timber forest product exploitation. Balachandra Hegde

INDONESIA

138. Conservation assessment for Sumatran elephants in Lampung Province, Sumatra. Margaret Kinnaird, Martin Tyson, Simon Hedges, Arnold Sitompul
139. Sulawesi Island-wide biodiversity surveys. Rob Lee, Jon Riley
140. Large mammal surveys in Bukit Barisan Selatan National Park. Margaret Kinnaird, Timothy O'Brien, Hariyo Wibisono
141. Bukit Barisan Tiger Conservation Program. Hariyo Wibisono,

- Untung Wijayanto, Timothy O'Brien
142. Movement patterns of Sumba citron crested cockatoo. Margaret Kinnaird, Hendra Kurniawan
143. Conservation education in north Sulawesi. Rob Lee
144. Effects of forest fires on vegetation and wildlife. Sunarto, Timothy O'Brien, Margaret Kinnaird, M. Iqbal
145. Effects of forest fragmentation on Sumba Island hornbills. Arnold F. Sitompul, Margaret Kinnaird
146. Orangutan ecology and conservation and training of Indonesian nationals. Elizabeth A. Fox
147. Ecology and conservation of Sumatran orangutans at Suaq Balimbing. Carel P. van Schaik
148. Factors affecting frugivore abundance and distribution. Margaret Kinnaird
149. Siamang behavioral ecology in Bukit Barisan Selatan National Park. Maya dewi Prasetyaningrum, Anton Nurcahyo, Yok-yok Hadipreksa
150. Effects of logging on biodiversity in eastern Borneo. Timothy O'Brien, Center for International Forestry Research
151. Ecology of Argus pheasant in south Sumatra. Nurul L. Winarn
152. Habitat selection and partitioning by squirrels in Bukit Barisan National Park. Asri A. Dwiyahreni
153. Predator-prey interactions between Asiatic wild dog and banteng and other ungulates on Java. Simon Hedges, Martin Tyson
- KAZAKHSTAN**
154. Ecology and conservation of a unique community of endangered eagles at the Naurzum Zapovednik. Todd Katzner
- DEMOCRATIC PEOPLES' REPUBLIC OF KOREA**
155. Conservation of biodiversity at Mt. Myohyang National Park in North Korea. William Duckworth
- LAO PEOPLE'S DEMOCRATIC REPUBLIC**
156. Nam Ha NBCA management unit strengthening project. Troy Hansel, Arlyne Johnson
157. Conservation skills training and public awareness. Troy Hansel
158. Xe Pian NBCA training for monitoring wildlife and threats to wildlife. Stephen Ling, Phaivanh Phiapalath
159. Wildlife of Lao database. Michael Hedemark
160. Herpetological survey. Bryan L. Stuart
- MALAYSIA**
161. Implementation of a Master Plan for Wildlife in Sarawak. Elizabeth Bennett, John G. Robinson
162. Large mammal survey and management in Krau Wildlife Reserve. Ruth K. Laidlaw
163. Helicopter radio-tracking of the giant flying fox, *Pteropus vampyrus natunae*, in Sarawak. Melvin T. Gumal
164. Effects of fire on non-volant mammals in Sabah. Jephthe Sompud
165. Training of Sarawak Forest Department staff in wildlife conservation and management. Michael Meredith, Elizabeth Bennett
166. Breeding biology and conservation management of the black-nest swiftlet, *Aerodramus maximus*, in Sarawak. Lim Chan Koon
167. The effects of logging on wildlife and hunting patterns in Sarawak and influences on this due to implementation of the Wildlife Master Plan. Cynthia Chin, Susan anak Musis Jantan
168. Understanding the interdependence between avian frugivores and fruit-producing plants in a Bornean rain forest. Johanna Choo
169. Biology and conservation of the sun bear in Sabah. Siew Te Wong
- MONGOLIA**
170. Research on Mongolian gazelles in the eastern steppes. George Schaller, Kirk Olson, B. Lhagvasuren
- MYANMAR**
171. Wildlife surveys. Alan Rabinowitz, U Saw Tun Khaing
172. Protected area review and evaluation. U Saw Tun Khaing, Madhu Rao
173. Training of protected areas staff. U Than Myint
174. Status and distribution of tigers in Myanmar. U Saw Htoo Tha Po, Alan Rabinowitz, U Saw Tun Khaing, Antony Lynam
175. Hkakaborazi landscape project. Alan Rabinowitz, U Saw Tun Khaing
176. Reptile surveys. Steven Platt
- PAPUA NEW GUINEA**
177. Systematics and ecology of the tube-nosed fruit bats. Nancy Irwin
178. Conservation education for PNG primary and secondary school curricula. Janine Watson, Lydia Dori
179. Crater Mountain Integrated Conservation & Development Project. Robert Bino, John Ericho
180. PNG biologist training for field techniques, project design, data analysis, and report writing. Andrew Mack, Debra Wright
181. Freshwater invertebrates in the Crater WMA. Kepslok Kumilgo
182. Rattan demography in the Crater WMA. Robert Sine
183. Bird of paradise behavior in PNG. Ed Scholes
184. Cassowary research in the Crater WMA. Andrew Mack, Debra Wright
185. Long-term tree diversity and dynamics in the Crater WMA. Debra Wright, Andrew Mack
186. Breeding and feeding behavior of the palm cockatoo in the Crater WMA. Paul Igag
187. Ecology of ringtail possums on Mt. Stolle. Suzette Stephens, Leo Salas
- PHILIPPINES**
188. Endemic flying foxes. Tammy Mildestein
189. Distribution, abundance, population genetics, and conservation of the Philippine crocodile. Frederick Pontillas
- RUSSIA**
190. Russian brown bear research and conservation in Kamchatka. William Leacock, George Schaller, Gleb Raygorodetsky
191. Siberian tiger project. Howard Quigley, Maurice Hornocker, John Goodrich, Dale Miquelle, Kathy Quigley, E. Smirnov, A. Astafiev
192. Distribution, status, and conservation of the Amur leopard. D.G. Pikunov, V.V. Aramilev, A. Murzine, Dale Miquelle
193. A monitoring program for the Amur tiger. Dale Miquelle, U. Dunishenko, D. Pikunov, V. Aramilev, P. Fomenko, G. Salkina, I. Nikolaev, V. Abramov
194. Ecology and conservation of sympatric brown bears and Himalayan black bears in Sikhotealin Biological Reserve, Russia. John Goodrich, Alexei Kostirya, Dale Miquelle
195. Ecology of ungulates in Sikhotealin Biological Reserve. Alexander Myslenkov, Olga Zaumuslava, Dale Miquelle
196. A protected area system for Khabarovsk Krai. A. Kulikov, V. Krukov, Dale Miquelle
197. Managing hunting leases for effective wildlife/tiger conservation. Vladimir Aramilev, Dale Miquelle
198. Conservation of Amur tigers on unprotected lands in northeast Primorski Krai: conservation, compensation, and education. Evgeny Smirnov, Dale Miquelle
199. Assistance to leopard conservation areas in southwest Primorye, Russia. Vladimir Aramilev, Dale Miquelle
200. Training a response team for tiger-people conflicts. Kathy Quigley, Dale Miquelle, Doug Armstrong, Bob Cook
201. Supporting the kids' ecology club "Uragus." Howard Quigley, Dale Miquelle
- SOLOMON ISLANDS**
202. Capacity building and conservation outreach training. Christopher E. Filardi, Catherine E. Smith
- THAILAND**
203. Indochina tiger conservation project. Antony Lynam
204. Khao Yai conservation project. Antony Lynam, WildAid, Royal Forest Department
205. Wildlife field research and conservation training program. Antony Lynam, Royal Forest Department
206. Ecological studies of Malayan tapir in Balahala Forest, southern Thailand. Suwat Kaewsirisuk
207. Bat community structure and habitat use in Thailand's lower eastern forest complex. Sara Bumrungsri
208. Conservation status, habitats, and monitoring of Thailand's remnant dugong populations. Suwan Pitaksintorn, Tippawan Sethapun
209. Rapid assessment surveys for avifauna in Thailand's upper eastern forest complex. Philip Round, Bird Conservation Society of Thailand
- TONGA**
210. Flying foxes and rain forest: maintaining forest regeneration as bat populations diminish. Kim McConkey, Don Drake

Latin America

ARGENTINA

211. Natural history and wildlife conservation. William Conway
212. Patagonian Coastal Zone Management Plan. William Conway, Graham Harris, Claudio Campagna, Pablo Yorio, Fundación Patagonia Natural, GEF-UNDP
213. Ecology and conservation of the Magellanic penguin. Dee Boersma, Pablo Yorio
214. Natural history of Patagonia, conservation strategies, and Península Valdés station management. Graham Harris
215. Punta Leon wildlife conservation. Pablo Yorio, Flavio Quintana, Graham Harris
216. Breeding seabirds of Golfo San Jorge: ecological aspects and management implications. Pablo Yorio, Flavio Quintana
217. Seabird conservation in Santa Cruz Province. Esteban Frere, Patricia Gandini
218. Sea lion ecology and conservation. Claudio Campagna
219. Andean leopard surveys. Andrés

Wildlife Conservation Projects

- Novaro, Pablo Perovic
220. Wildlife conservation and management in the Patagonian steppe. **Andres Novaro, Martín Funes, Susan Walker, CEAN**
221. Ecology and conservation of the huemul. **Alejandro Vila**
222. Seed dispersal of the mistletoe, a key process in temperate forest conservation. **Marcelo Aizen**
223. Baseline health parameters of free-ranging raptors in Argentina. **Sharon L. Deem, Marcela M. Uhart, Miguel D. Saggese, Maria C. Ferreyra-Armas, Marcelo Romano, Hebe Ferreyra, Fernando Pedrosa**
- BELIZE**
224. National biodiversity database development and management capacity building. **Bruce Miller, Carolyn Miller, Belize Audubon Society**
225. Selva Maya monitoring. **Bruce Miller, Carolyn Miller, Archie Carr III**
226. Ecology of insectivorous bats. **Bruce Miller, Carolyn Miller**
227. Selva Maya database and gap analysis. **Bruce Miller, Carolyn Miller**
228. Density of jaguars and habitat use in Gallon Jug. **Carolyn Miller**
229. Impacts of tourism on black howler monkeys. **Adrian Treves**
- BOLIVIA**
230. Andean mammal research and training in Cotapata National Park. **Lucho Pacheco, Alejandra Roldán**
231. Impacts of forestry on wildlife. **Damián Rumiz, Museo de Historia Natural NKM, BOLFOR/WCS/Chemonics, USAID**
232. Kaa-Iya del Gran Chaco National Park. **Michael Painter, Andrew Noss, Evelio Arambiza, Andrew Taber, WCS/CABI, USAID**
233. Madidi National Park wildlife research and planning. **Robert Wallace, Lilian Painter**
234. Bolivia conservation management and policy group. **Michael Painter, Andrew Taber, John Robinson**
235. Spectacled bear ecology and interactions with humans. **Robert Wallace, David Garshelis, Susanna Paisley**
236. Flamingo ecology and conservation. **Omar Rocha, Felicity Arengo, Nación Originaria Uro Murato, Dirección General de Biodiversidad**
237. Lowland mammal surveys. **Louise Emmons**
238. Serologic and pathologic evaluation of brocket deer and collared peccary at Kaa-Iya National Park. **Sharon Deem, William Karesh, Marcela M. Uhart, Andrew Noss, Richard Villarroel, Rosa Leny Cuellar, Michael Linn, Tracey McNamara**
239. Health evaluation of captive and free-ranging blue-fronted Amazon parrots in the Bolivian Chaco. **Sharon L. Deem, Andrew Noss, Richard Villarroel, Rosa Leny Cuellar**
240. Anesthesia and baseline health parameter studies of nine-banded armadillos in the Bolivian Chaco. **Sharon L. Deem, Andrew Noss, Richard Villarroel, Rosa Leny Cuellar**
- BRAZIL**
241. Flooded forest conservation in the Central Amazon. **Mamirauá Ecological Reserve, José Márcio Ayres, Sociedad Civil Mamirauá (WCS/WWF/ODA/CNP/ EU)**
242. Amanã Sustainable Development Reserve research and management. **José Márcio Ayres**
243. Carnivore feeding ecology and patterns of habitat use in the Caatinga. **Frank Wolff**
244. Ecology and management of black and spectacled caiman. **Ronis DaSilveira, John Thorbjarnarson**
245. Conservation of river turtles in Mamirauá Sustainable Development Reserve. **Richard Vogt, John Thorbjarnarson**
- COLOMBIA**
246. Student grants program. **María Elfi Chaves, FES, Instituto Humboldt**
247. Center of Excellence in Conservation Science. **María Elfi Chaves, Gustavo Kattan, Carolina Murcia, Christian Samper, Instituto Humboldt, Ministerio del Ambiente**
248. High Andes bird communities. **Gustavo Kattan/CARDER**
249. Cloud forest regeneration in Ucumari Regional Reserve. **Carolina Murcia/CARDER**
250. Mountain tapir ecology in Ucumari Regional Reserve. **Jaine Cavalier, Diego Lizcano**
251. Colombia wildlife veterinary training course. **Sharon Deem, Marcela Uhart**
- COSTA RICA**
252. Mesoamerican Biological Corridor Planning. **Mario Boza, GTZ/CCAD**
253. Strategic financial planning and fund-raising for Costa Rican conservation areas. **Mario Boza, Clara Padilla**
- CUBA**
254. Ecology and conservation of the American crocodile. **Roberto Rodríguez Soberón, Manuel Alonzo Tabet, John Thorbjarnarson**
- ECUADOR**
255. Sustainable Use of Biological Resources Project. **Jody Stallings, David Thomas, Robert Williams, Peter Fensinger, EcoCiencia, Jatun Sacha, WCS/ USAID/ CARE**
256. Biodiversity conservation at the landscape scale. **Robert Williams, EcoCiencia**
257. Wildlife ecology training. **Peter Feinsinger**
258. Vegetation mapping. **Rodrigo Sierra**
- GUATEMALA**
259. Uaxactún community conservation, natural resource management, and studies of wildlife use. **Roan McNab, John Polisar, James Barborak**
260. Effects of tropical forest alteration and human depredation on habitat use by mealy parrots. **Robin Bjork**
261. Effects of seed dispersal by black howler monkeys. **Amy Rogers**
262. Distributional patterns, species richness, and diversity of small mammals in montane cloud forests. **Salvador Lou Vega**
- HONDURAS**
263. Northern coast and Bay islands protected area management plans. **James Barborak, Carla Suárez, Christine Housel, Mike Lara, Andrew Stoll, Archie Carr III, Cathryn Wild, Roger Morales, USAID, Fundación Vida, COHDEFOR, SERNA, Summit Foundation**
- MEXICO**
264. Assessment of status of wildlife conservation. **Rodrigo Medellín**
265. Distribution of the Caribbean manatee in the Chetumal Bay Manatee Sanctuary. **León Olivera Gómez**
- NICARAGUA**
266. Marine turtle conservation on the Caribbean coast. **Cynthia Laguex, Cathi Campbell**
267. Preserving wildlife habitat on shade coffee plantations, using mantled howler monkeys as umbrella species. **Colleen McCann, Juan Carlos Martinez, Fundación Cocibolca, Kim Williams-Guillen**
268. Health evaluation of green turtles in the Caribbean waters off the coast. **Sharon L. Deem, Cynthia Laguex, Cathi Campbell, Ellis Greiner, Larry Herbst, Carolyn Cray**
- PERU**
269. Coastal wildlife conservation at Punta San Juan. **Patricia Majluf**
270. Fisheries and marine mammal conflicts. **Patricia Majluf**
271. Macaw ecology and conservation. **Charles Munn**
272. Vicuña conservation in the Salinas-Aguada Blanca Reserve. **Catherine Sahley**
273. Longitudinal analysis of community-based wildlife management in the Peruvian Amazon. **Richard Bodmer**
274. Garden hunting in Tambopata. **Lisa Naughton**
275. Health evaluation of guanay cormorants on the coast. **Sharon L. Deem, William Karesh, Robert A. Cook, Patricia Majluf, Pamela Dennis**
- VENEZUELA**
276. Biodiversity of the Caura River watershed: characteristics and conservation priorities. **José Ochoa, ACOANA, CONICIT, Fundación Polar**
277. Small mammal inventory and conservation. **José Ochoa**
278. Student grant program. **Isabel Novo, EcoNatura**
279. Ecology and habitat use of spectacled bears. **Isaac Goldstein**
280. Fish diversity in the Caura River. **Conrad Vispo, UNELLEZ, Fundación La Salle**
281. Yellow-shouldered Amazon ecology and conservation. **Franklin Rojas-Suárez, Ana Trujillo, Adriana Rodríguez, PROVITA**
282. Conservation of the Orinoco crocodile. **Andres E. Seijas, John Thorbjarnarson**
- REGIONAL**
283. Ecological corridor of the Americas. **Mario Boza, Clara Padilla, Archie Carr III, James Barborak, Felicity Arengo, Eric Sanderson, Andrew Taber**
284. South America training coordination. **Maria Elfi Chavez, Peter Feinsinger**
285. Survey of the high-Andes flamingos. **Mariana Valqui, Sandra Caziani, Patricia Marconi, Omar Rocha, Eduardo Rodríguez, Juan Pablo Contreras, Felicity Arengo**
286. Mesoamerican Trail System Planning and Development. **James Barborak, Archie Carr III, Christine Housel, Andrew Stoll, Melissa Boness, Adelaida Chaverri, CCAD, World Bank, Dutch Government**
287. Mesoamerican Barrier Reef System GEF Project Planning. **James Barborak, Archie Carr III, World Bank/GEF, CCAD**
288. Training courses for Latin American park staff. **James Barborak, UN University for Peace, Colorado State University**
289. Development of biological monitoring for the Maya Forest (Guatemala, Belize, Mexico). **Archie Carr III, Bruce Miller, Carolyn Miller, Roan McNab, MAB/TED**
290. Jaguar conservation priority-setting workshop. **Alan Rabinowitz, Andrew Taber, Rodrigo Medellín, Cheryl Chetkiewicz, Eric Sanderson**

North America

291. Baseline information and monitoring of the migratory red knot in the Arctic and Tierra del Fuego. **Larry Niles**
292. Causes and geography of hardwood regeneration failure in the Adirondacks. **Jerry Jenkins**
293. Atlas of the Adirondacks. **Jerry Jenkins, Andy Keal, Heidi Kretser, Bill Weber, Sarah Ward**
294. Adirondack Community Information Centers. **Heidi Kretser**
295. Paul Smith's College Capstone Program. **Heidi Kretser**
296. Improving the economic benefits of outdoor recreation tourism in the Adirondack Park. **Tim Holmes, Heidi Kretser**
297. Gateways Community Group. **Cali Brooks, Heidi Kretser**
298. Oswegatchie roundtables: a multi-stakeholder forum in the Adirondacks. **Bill Weber**
299. Developing a GIS data base for conservation planning in the Adirondacks. **Andrew Keal**
300. Ten Rivers Program. **Andrew Keal**
301. Hearing a chorus among the howls: evaluating opportunities for collaborative environmental policy-making in the Adirondack Park. **Robb Cowie**
302. Mesocarnivores of northeastern North America: status and conservation issues. **Justina Ray**
303. The ecology of coyotes in north-eastern North America. **Matthew Gompfer, Justina Ray**
304. Best management practices for wetland landscapes in the north-eastern U.S. **Aram Calhoun, Michael Klemens, Environmental Protection Agency, Maine Audubon**
305. Bog turtle ESA Recovery Plan. **Carole Copeyon, Michael Klemens, state wildlife agencies**
306. Bog turtle habitat protection in the Wallkill Valley. **Andrew Milliken, Jim Sciascia, Libby Herland, Michael Klemens, Jason Tesaro**
307. Community Leadership Alliance Training. **John Nolon, Michael Klemens, Jayne Daly**
308. Croton to Highlands Corridor. **Michael Klemens, James McDougal, Damon Oscarson, Andrew Block, towns of Cortlandt, New Castle, Putnam Valley, Yorktown**
309. Eastern Westchester biotic corridor. **Michael Klemens, James McDougal, Damon Oscarson, Scott Sharlow, Claudia Mausner, Andrew Block, towns of Pound Ridge and Lewisboro**
310. Genetics and conservation of mole salamanders in New York, New Jersey, and Pennsylvania. **Michael Klemens, James Bogart**
311. Great Swamp cooperative conservation program. **Michael Klemens, James McDougal, Great Swamp Intermunicipal Council**
312. IUCN/SSC Species Editorship. **Michael Klemens, Michelle Black, Carolina Caceres, Diane Cavalieri**
313. Nashua River Valley wetland fragmentation study. **David Black, Richard Griffiths, Michael Klemens**
314. Nature in Fragments: The Legacy of Urban Sprawl Symposium. **Michael Klemens, Elizabeth Johnson, James McDougal, Fiona Brady**
315. Open Lands Acquisition: Local financing techniques under New York State law. **Jeffrey LeJava, Mark Rieley, John Nolon, Michael Klemens, James McDougal, Katherine Daniels, town of Warwick, NY**
316. Stewart State Forest management plan. **Michael Klemens, James McDougal, Damon Oscarson, NYSDEC**
317. Turtle conservation handbook. **Michael Klemens, James McDougal, George Amato, John Thorbjarnarson, Cynthia Lagueux, Doreen Bolze, Smithsonian Institution Press**
318. Upper Wallkill Valley Countryside Exchange. **James McDougal, Glynwood Center, Michael Klemens, towns of Warwick, NY, Vernon, NJ**
319. Walkill Valley project. **Michael Klemens, James McDougal, Tony Martinez, Spider Barbour**
320. Lynx surveys across the northern United States using DNA analysis of hair left on scented rubbing posts. **John Weaver, George Amato, Warren Johnson**
321. Lynx, snowshoe hare, and forest landscape management in the northern Rockies. **John Weaver**
322. Taku River predator surveys. **John Weaver**
323. Arctic Odyssey: building public support for the Arctic National Wildlife Refuge. **John Weaver**
324. Cougar-wolf interactions in Yellowstone National Park. **Toni Ruth**
325. Bison, ecology, and brucellosis in the southern greater Yellowstone ecosystem. **Joel Berger, Carol Cunningham, Steve Cain**
326. Moose and other ungulate responses to the loss and colonization of large carnivores (Grand Teton, Yellowstone). **Joel Berger**
327. Effects of predation loss on caribou (Greenland, Svalbard-Norway). **Joel Berger**
328. Moose density and avian species diversity in willow riparian habitats. **Joel Berger, Peter B. Stacey**
329. Human hunting and mammalian scavenger communities (Grand Teton). **Sanjay Pyare, Joel Berger**
330. Lynx abundance (Grand Teton). **Sanjay Pyare, John Weaver, Joel Berger**
331. Geography and wildlife concerns of the "Sudden Oak Death Syndrome" in California. **Steve Zack**
332. Wildlife response to fire and fire surrogate experiments nationwide. **Steve Zack, USDA Forest Service, National Park Service, universities**
333. Bird responses to experimental restoration of late-successional characteristics of eastside pine forests of northeastern California. **Steve Zack, Pacific Southwest Research Station, USDA Forest Service, Humboldt State University**
334. Responses of birds and small mammals to experimental silvicultural and prescribed fire actions to accelerate development of characteristics of late seral stage forests. **Steve Zack, Pacific Southwest Research Station, USDA Forest Service, Humboldt State University**
335. Neotropical migratory bird response to restoration in riparian areas. **Steve Zack, Hilary Cooke**
336. Woodpeckers, bark beetles, fungi, and the decay process in pines: How are snags for wildlife created? **Steve Zack, Kerry Farris**
337. Partners-In-Flight Oak Woodland Conservation Plan. **Steve Zack, Point Reyes Bird Observatory**
338. Restoring pollinator habitat for native plant communities and agriculture in the Cache Creek Watershed (northern California). **Claire Kremen**
339. Bald eagle ecology, ecotourism, and community conservation in the Chilkat Valley of southeast Alaska. **Angie Hodgson**
345. Capacity building for marine conservation in the western Pacific. **Liz Lauck**
346. Coral reef and algae population dynamics and reef restoration in Belize. **Tim McClanahan**
347. Evaluating the effectiveness of the reserve and conservation area at Glovers Reef, Belize. **Tom Ihde**
348. An evaluation of the elasmobranch fauna of Glovers Reef, Belize. **Ellen Pikitch, Liz Lauck, Beth Babcock**
349. Space utilization, movements, habitat selection, and population genetics of the Caribbean reef shark at the Fernando de Noronha archipelago, Brazil. **Ricardo Garla, Demian Chapman**
350. Conservation priorities for green sturgeon in the Rogue River, Oregon. **Dan Erickson**
351. Using demographic information to construct Bayesian priors for the intrinsic rate of increase: application to Atlantic shark stock assessment. **Murdoch McAllister, Ellen Pikitch**
352. Catch and bycatch of seabirds and marine mammals by the small-scale fishery of Punta San Juan, Peru. **Patricia Majluf, Beth Babcock**
353. The status of coral reef ecosystems and sociocultural institutions associated with fisheries in Asia's coral triangle. **Tim McClanahan**
354. Coral reef conservation at Glovers Reef Marine Research Station, Belize. **Tom Bright, Cindy Liles, Chuck Carr, Ellen Pikitch**
355. A seascape approach to fisheries management and biodiversity conservation. **Ellen Pikitch**
356. A dynamic programming model of fishing strategy choice in a multi-species trawl fishery. **Beth Babcock, Ellen Pikitch**
357. Application of a non-equilibrium generalized production model to South and North Atlantic swordfish: combining Bayesian and demographic methods for parameter estimation. **Murdoch McAllister, Beth Babcock, Ellen Pikitch, Michael Prager**
358. Catch rates of blue sharks (*Prionace glauca*) in the U.S. Atlantic recreational fishery. **Beth Babcock, Ellen Pikitch, Murdoch McAllister**
359. Reef fishes of Belize. **Jacque Carter**
360. Conservation of grouper spawning aggregations in Belize. **Enric Sala**
361. Conserving and restoring the ocean's large pelagic fishes. **Ellen Pikitch, Liz Lauck**
362. International pelagic shark workshop. **Ellen Pikitch, Liz Lauck, Beth Babcock, Dan Erickson**

Marine Programs

340. Conservation of Kenya's coral reefs. **Tim McClanahan**
341. Population assessment of exploited benthic species at the Glovers Reef Marine Reserve, Belize. **Charles Acosta**
342. Trade in shark fins: population impacts and implications for shark fishery management. **Shelley Clarke**
343. Testing an artificial bait in the Alaskan longline fishery. **Dan Erickson**
344. Development of a fishery management plan for Pacific highly migratory species. **Dan Erickson**



FINANCIAL RESULTS FOR THE YEAR were positive in many ways. Operating expenditures, however, exceeded operating revenue by \$2.2 million. Reducing costs where it could, WCS continued to invest in the future while meeting certain transitional costs associated with changes in management. Contributed support increased by more than 22 percent to nearly \$14 million, including \$5 million in unrestricted giving. Membership revenue grew by 14 percent—the fifth consecutive year this source

registered a double-digit increase. The Lila Acheson Wallace Fund provided \$5.3 million in operating grants for Bronx Zoo and Central Park Wildlife Center programs. Investment return appropriated for operations provided \$7.7 million, a 20 percent increase.

The City of New York continued its partnership with WCS, increasing operating support by 7 percent to \$21 million. New York State provided \$1.7 million, principally through the Natural Heritage Trust, for Bronx Zoo and New York Aquarium initiatives. Federal support included \$2 million for Africa programs from the United States

Agency for International Development. The National Science Foundation supported Bronx Zoo education programs.

Visitor attendance remained level at 4.5 million. An increase at the Bronx Zoo offset moderate declines at the Aquarium and Wildlife Centers. Exhibits admissions increased 26 percent, reflecting the popularity of the new Congo Gorilla Forest, where visitors can direct their admission fees to field projects. Restaurant and merchandise sales increased by 8 percent to \$15 million. Demand for onsite education programs increased, but this source remained level due to lack of classroom space.

Operating expenditures rose 13 percent, to \$99.6 million. Program services, including onsite visitor-related costs, represented 85 percent of expenses. Bronx Zoo and Aquarium expenditures increased by more than 10 percent. In large measure, this reflected operating costs occasioned by Congo Gorilla Forest and renovations at the Aquarium. International Programs increased by 22 percent, reflecting continued growth in the number of WCS field projects. Increases in management and general expenditures included one-time costs associated with management changes.

Capital expenditures amounted to \$18.4 million, of which \$11 million was expended on the Dancing Crane Café, which is scheduled to open in early 2001. Planning continued on a new restaurant facility at the Aquarium, and work was under way for modular office space at the Bronx Zoo.

WCS continues to reach more people as it seeks to fulfill its commitment to wildlife exhibition, education, and conservation. Government funding remains substantial. Yet, these funds provide for only about one-quarter of our needs. Fortunately, they are generously supplemented by a supportive constituency. The tradition of joint public and private support has enabled WCS programs to flourish. As WCS expands its local, national, and international roles, it is more important than ever that this cooperative effort be sustained.

Opposite: The Bronx Zoo's flock of Chilean flamingos will grace the Dancing Crane Café, part of the new food and retail complex designed to enhance our ability to serve our visitors. **Above:** Senior Wild Animal Keeper Emily Ladwig checks out a group of captive-bred American flamingos that will replace the Chileans at the zoo's Aquatic Birds Building.



Operating Revenues and Expenses

Year ending June 30, 2000 (with comparative amounts for 1999)

	\$ THOUSANDS	
REVENUE	2000	1999
Contributed	\$13,988	\$11,412
Membership Dues	6,977	6,120
Lila Acheson Wallace Fund	5,328	5,050
Investment Income	7,716	6,435
City of New York	21,020	19,702
New York State	1,704	1,668
Federal Agencies	3,260	2,485
Gate Admissions	11,412	11,390
Exhibit Admissions	3,578	2,832
Visitor Services	15,092	14,026
Education Programs	2,384	2,323
Other	4,928	3,906
Total Revenue	\$97,387	\$87,349
 EXPENDITURES		
Program Services		
Bronx Zoo	\$34,930	\$31,279
New York Aquarium	9,578	8,692
Wildlife Centers	11,921	11,526
International Programs	16,749	13,722
<i>Wildlife Conservation Magazine</i>	1,838	1,752
Total Program Services	\$75,016	\$66,971
Visitor Services	\$9,347	\$8,154
 Supporting Services		
Management and General	\$9,785	\$7,260
Membership	3,146	3,196
Fundraising	2,313	2,250
Total Supporting Services	\$15,244	\$12,706
Total Expenses	\$99,607	\$87,831
Deficit	\$(2,220)	\$(482)

A copy of the audited financial statements is available upon request.



Gala 2000

TOP ROW, FROM LEFT: WCS Chairman David T. Schiff with honorees Lewis and Jack Rudin; Kathy Moore and Culvert Moore; Dinner Co-chairs Tina and Trustee William E. Flaherty; Mr. Schiff, Trustee Mrs. Charles A. Dana Jr., Honorary Chairperson H.R.H. Infanta Doña Pilar de Borbon, and Dinner Co-chair Trustee Daniel Thorne. Second row: Beth Rudin DeWoody and Jack Rudin; Honorary Trustee Mrs. Joseph A. Thomas; Mr. Schiff and honoree William Conway; Nancy and Honorary Trustee Eben Pyne. Third row: Ashley Schiff and Mrs. David Schiff; Leonard Stern, Catherine Cahill, and William Bernhard; Dinner Co-chair Mrs. Carroll Petrie. Fourth row: Gordon and Trustee Mrs. Gordon Patee. Trustee Andrew Tisch, Lacey Tisch, Billie Tisch, Tom Labrecque, and Laurence Tisch. Bottom row: Scott Schiff, Kathleen Ryan, Karenna Gore Schiff, and Andrew Schiff.



Highlights 2000

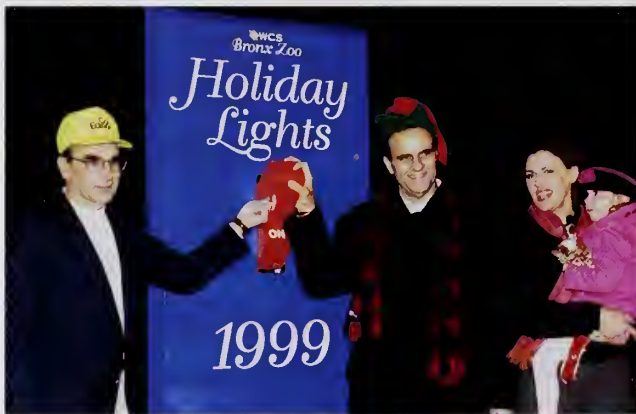
THE YEAR'S EVENTS reflected WCS's leadership locally, regionally, and internationally. This page, clockwise from above: At the Save-the-Tiger event, Exxon Mobil's Tony Atkins and Director of Living Institutions Richard Lattis. New York City Mayor Rudolph Giuliani filmed a Lion King satire at the Bronx Zoo. WCS Trustees and Advisors celebrated the Bronx Zoo's 100th birthday in the Galápagos. Herpetology Collections Manager Bill Holmstrom and zoo spokesman Jack Hanna. Opposite, clockwise from top left: Michael Dale and Jaguar Cars North America's support of jaguar initiative. At the West Nile Virus Action Workshop, Chief Veterinarian Bob Cook, Wildlife Conservation Fellow Dr. Brian Currie, New York Assembly Speaker Sheldon Silver, Chief Pathologist Tracey McNamara, and New York State Assemblyman Richard Brodsky. New York City Council Speaker Peter Vallone and WCS Chairman David Schiff. Bronx



Zoo General Curator James Doherty and Lynn Sherr, of ABC's 20/20. Mr. Schiff presents WCS Gold Medal to outgoing President William Conway. Richard Lattis, Acting President James Large, Bronx Borough President Fernando Ferrer, and Senior Vice President for Government Affairs John Calvelli. Explorers' Party co-chairs Katy Norton and Ritchey Howe. WCS Trustee Murray Gell-Mann and Mr. Schiff. New York State Parks Commissioner Bernadette Castro at Congo Gorilla Forest.



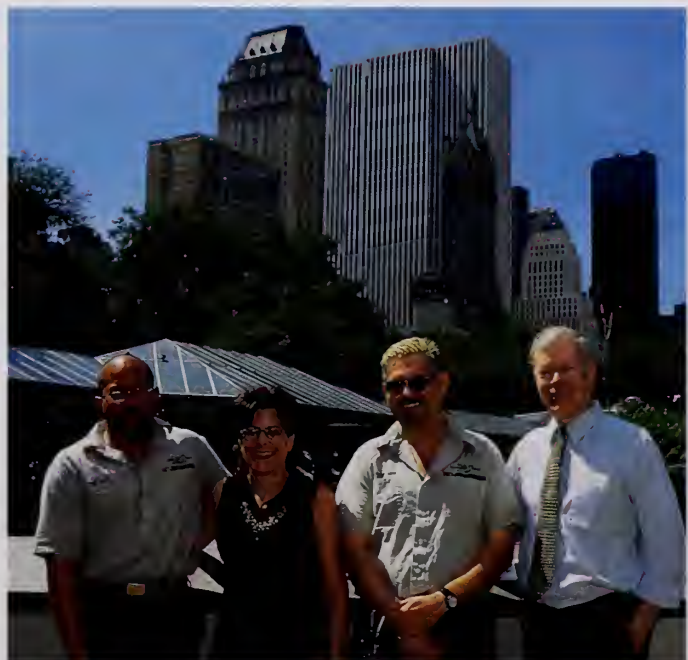






Opposite, from top left: New York Governor George Pataki and family at the Bronx Zoo's Holiday Lights. Restaurants Manager Alfredo Piscitelli and former Yankees pitcher Sparky Lyle at a seasonal employee recognition day. The Holiday Express train took its first run. Mongolian performers at Himalayan Highlands event. BBC's Sir David Attenborough and Mammalogy Collections Manager Penny Kalk at Congo Gorilla Forest. Monica Winski (forefront) was the one-millionth visitor to the Congo exhibit. Robert W. Donohue, Con Edison Senior Vice President, Electric Operations, and Yankees manager Joe Torre and family open Holiday Lights.

This page, from above: Chief Pathologist Tracey McNamara and Lab Supervisor Alfred Ngboloki demonstrate the laboratory's capabilities to New York Representative José Serrano. NY Liberty player Becky Hammon at the New York Aquarium. In March, Julia Rose was the 10-millionth visitor to the Central Park Zoo. Long-time WCS employees at Central Park Zoo include (from left to right) Animal Department Supervisor Anthony Brownie, Living Institutions Administrator Denise McClean, Senior Wild Animal Keeper William Shesko, and Director Dan Wharton. Mr. Schiff, Robert Kennedy, and Aquarium Director Louis Garibaldi at Dinner by the Sea presentation of Conservation Award to Pace Litigation Clinic.





Above: Mongolian wild horses at the Bronx Zoo. Opposite: Twin babirusas born at the Bronx Zoo.

Bronx Zoo

	Species and subspecies	Specimens owned	Births/Hatchings			
MAMMALS				Anseriformes—Swans, ducks	32	247
Marsupialia—Kangaroos, gliders	2	9	1	Falconiformes—Vultures, eagles	6	11
Insectivora—Hedgehogs, tree shrews	2	28	0	Galliformes—Maleos, pheasants, etc.	23	203
Chiroptera—Bats	5	598	70	Gruiformes—Cranes, rails, etc.	9	22
Primates—Apes, monkeys, etc.	35	202	30	Charadriiformes—Plovers, gulls, etc.	16	93
Edentata—Sloths	2	2	0	Columbiformes—Pigeons, doves	14	60
Lagomorpha—Rabbits	2	1	0	Psittaciformes—Parrots	33	80
Rodentia—Squirrels, rats, gerbils, etc.	35	475	130	Cuculiformes—Touracos, cuckoos, etc.	5	12
Carnivora—Bears, cats, dogs, etc.	17	72	4	Strigiformes—Owls	3	5
Pinnipedia—Sea lions	1	5	0	Caprimulgiformes—Frogmouths	2	3
Proboscidea—Elephants	1	7	0	Coliiformes—Mousebirds	1	1
Hyracoidea—Hyraxes	1	37	13	Coraciiformes—Rollers, hornbills, etc.	22	58
Perissodactyla—Horses, rhinos, etc.	5	26	0	Piciformes—Barbets, toucans, woodpeckers	6	10
Artiodactyla—Cattle, antelope, etc.	27	430	31	Passeriformes—Perching birds	59	172
Totals	135	1,892	279	Totals	254	1,160
BIRDS				REPTILES AND AMPHIBIANS		
Struthioniformes—Ostriches	2	8	0	Chelonina—Turtles	43	362
Rheiformes—Rheas	1	7	0	Crocodylia—Alligators, caimans, crocodiles	8	223
Casuariiformes—Cassowaries, emu	2	6	0	Squamata (Sauria)—Lizards	30	131
Tinamiformes—Tinamous	1	7	0	Squamata (Serpentes)—Snakes	31	108
Sphenisciformes—Penguins	1	9	0	Caudata—Salamanders	7	53
Pelicaniformes—Pelicans, cormorants, etc.	3	20	0	Anura—Frogs, toads	23	237
Ciconiiformes—Heron, flamingos, etc.	13	126	16	Totals	142	1,114
				Bronx Zoo Census	531	4,166
						685

Children's Zoo, Bronx Zoo

	Species and subspecies	Specimens owned	Births/ Hatchings
MAMMALS			
Marsupialia—Wallabies	2	9	0
Primates—Lemurs	1	9	0
Edentata—Armadillos	2	5	0
Lagomorpha—Rabbits	1	14	0
Rodentia—Squirrels, rats, beavers, etc.	12	71	12
Carnivora—Foxes, otters, etc.	7	26	0
Hyracoidea—Hyrax	1	2	0
Perissodactyla—Horses	2	7	1
Artiodactyla—Goats, sheep, camels, etc.	6	70	13
Totals	34	213	26

BIRDS

Pelecaniformes—Pelicans	1	2	0
Ciconiiformes—Hérons	1	36	8
Anseriformes—Ducks, geese	8	54	7
Falconiformes—Vultures, hawks, etc.	5	10	0
Galliformes—Chickens, bobwhites	4	64	0
Columbiformes—Doves	1	7	0
Psittaciformes—Parrots	12	35	0
Strigiformes—Owls	5	9	0
Caprimulgiformes—Frogmouths	1	1	0
Piciformes—Toucans	2	2	0
Passeriformes—Perching birds	2	2	0
Totals	42	222	15

REPTILES AND AMPHIBIANS

Chelonia—Turtles	10	54	0
Crocodylia—Alligators	1	7	0
Squamata (Sauria)—Lizards	9	32	0
Squamata (Serpentes)—Snakes	7	51	0
Caudata—Salamanders	1	18	0
Anura—Frogs, toads	4	19	0
Totals	32	181	0

Children's Zoo Census 108 616 41

St. Catherines Wildlife Survival Center, Georgia

	Species and subspecies	Specimens owned	Births/ Hatchings
MAMMALS			
Primates—Lemurs, macaques	6	77	12
Perissodactyla—Zebras	1	2	0
Artiodactyla—Antelope	8	55	5
Totals	15	134	17

BIRDS

Ciconiiformes—Storks	3	5	0
Galliformes—Pheasants	6	23	2
Gruiformes—Cranes, bustards	9	59	5

Psittaciformes—Parrots	11	72	8
Coraciiformes—Hornbills	7	18	2
Totals	36	177	17

REPTILES

Chelonia—Turtles	3	120	20
Squamata (Sauria)—Lizards	1	1	0
Squamata (Serpentes)—Snakes	1	2	0
Totals	5	123	20

Wildlife Survival Center Census 56 434 54

Central Park Wildlife Center

	Species and subspecies	Specimens owned	Births/ Hatchings
MAMMALS			
Insectivora—Hedgehogs, shrews	2	5	0
Chiroptera—Bats	3	390	80
Primates—Monkeys	6	14	1
Lagomorpha—Rabbits	1	9	0
Rodentia—Acouchis, squirrels	1	2	0
Carnivora—Bears, otters, pandas	5	10	0
Pinnipedia—Seals, sea lions	2	5	0
Artiodactyla—Hoofed mammals	5	10	7
Totals	25	445	88

BIRDS

Sphenisciformes—Penguins	3	66	11
Ciconiiformes—Egrets	2	6	0
Anseriformes—Swans, ducks, geese	13	41	6
Galliformes—Partridges, tragopans	6	26	7
Gruiformes—Bitterns	1	1	0
Charadriiformes—Puffins	1	17	4
Columbiformes—Doves, pigeons	5	42	10
Psittaciformes—Parrots	2	6	0
Cuculiformes—Turacos	1	2	0



Animal Census



Above: Emerald tree boa at Prospect Park. Below: Thick-billed parrots at Queens. Opposite: Leafy sea dragon at the New York Aquarium.

Coliiformes—Mousebirds	1	4	0
Piciformes—Toucans	1	2	0
Passeriformes—Perching birds	25	97	21
Totals	61	310	59

REPTILES AND AMPHIBIANS

Chelonia—Turtles	11	105	14
Squamata Sauria—Lizards	10	242	6
Squamata Serpentes—Snakes	16	52	19
Caudata—Salamanders	2	36	6
Anura—Toads and frogs	15	122	11
Totals	54	557	56

Central Park Wildlife Center Census	140	1,312	203
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Queens Wildlife Center

MAMMALS

	Species and subspecies	Specimens owned	Births/Hatchings
Lagomorpha—Rabbits	1	5	0
Rodentia—Prairie dogs	2	9	0
Carnivora—Pumas, bears, bobcats	4	12	0
Pinnipedia—Sea lions	1	4	0
Perissodactyla—Horses	2	3	0
Artiodactyla—Elk, bison, goats, sheep	8	44	1
Totals	18	77	1

BIRDS

Ciconiiformes—Egrets	1	8	0
Anseriformes—Ducks, geese	19	175	14
Falconiformes—Eagles	2	2	0
Galliformes—Turkeys	2	15	0
Gruiformes—Cranes	1	2	2
Columbiformes—Pigeons, doves	1	3	0
Psittaciformes—Parrots	2	11	0
Strigiformes—Owls	2	3	0
Passeriformes—Perching birds	13	63	10
Totals	43	282	26

REPTILES

Chelonia—Turtles	3	44	0
Crocodylia—Alligators	1	2	0
Squamata (Serpentes)—Snakes	3	3	0
Totals	7	49	0

Queens Wildlife Center Census	68	408	27
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Prospect Park Wildlife Center

MAMMALS

	Species and subspecies	Specimens owned	Births/Hatchings
Marsupialia—Wallabies	3	9	0
Insectivora—Hedgehogs, etc.	1	1	0
Primates—Tamarins, baboons	2	12	2
Lagomorpha—Rabbits	1	4	0
Rodentia—Prairie dogs, gerbils, etc.	11	74	18
Carnivora—Pandas, meerkats	4	9	0
Pinnipedia—Sea lions	1	3	0
Hyracoidea—Hyrax	1	7	0
Artiodactyla—Cows, goats, sheep	4	10	0
Totals	28	129	20





BIRDS

Casuariiformes—Emu	1	2	0
Anseriformes—Geese, ducks	1	2	0
Falconiformes—Eagles	1	1	0
Galliformes—Bobwhites, pheasants, etc.	2	9	0
Gruiiformes—Cranes	1	2	0
Columbiformes—Doves	2	5	0
Psittaciformes—Parrots	3	6	0
Cuculiformes—Touracos, cuckoos, etc.	1	1	0
Strigiformes—Owls	2	3	0
Coraciiformes—Kingfishers, bee-eaters, etc.	1	2	0
Passeriformes—Perching birds	5	21	0
Totals	20	54	0

REPTILES AND AMPHIBIANS

Chelonia—Turtles	9	59	0
Squamata Sauria—Lizards	8	33	1
Squamata Serpentes—Snakes	8	11	0
Caudata—Salamanders	2	4	0
Anura—Frogs	13	108	5
Totals	40	215	6

Prospect Park Wildlife Center Census	88	398	26
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New York Aquarium

MARINE MAMMALS

	Species	Specimens
Pinnipedia—Sea lions, walrus, sea otters	6	18
Cetacea—Whales, dolphins	2	6
Totals	8	24

BIRDS

Sphenisciformes—Penguins	1	41
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REPTILES

Chelonia—Turtles	5	9
Crocodylia—Alligators	1	2
Totals	6	11

AMPHIBIANS

Anura—Toads and frogs	4	28
Caudata—Newts	1	1
Totals	5	29

CARTILAGINOUS FISHES (CHONDRICHTHYES)

Heterodontiformes—Horn sharks	1	1
Lamniformes—Mackeral sharks	1	7
Carcharhiniformes—Ground sharks	4	18
Orectolobiformes—Carpet sharks	2	4
Rajiformes—Rays, skates	4	12
Totals	12	42

BONY FISHES (OSTEICHTHYES)

Lepidosireniformes—Lungfishes	1	2
Acipenseriformes—Sturgeons	1	5
Elopiformes—Tarpon	1	3
Anguilliformes—Eels, morays	1	3
Osteoglossiformes—Arawana	3	3
Salmoniformes—Trout	2	87
Beloniformes—Ricefish	1	11
Cypriniformes—Minnows, carp	7	73
Characiformes—Cave fish, piranha, tetra	15	1,036
Siluriformes—Catfish	11	31
Gymnotiformes—Electric eel	1	2
Batrachoidiformes—Toadfish	1	3
Cyprinodontiformes—Swordtails	4	197
Atheriniformes—Silversides	5	253
Gadiformes—Codfish	3	106
Scorpaeniformes—Rockfish, stonefish	13	33
Beryciformes—Squirrelfish, flashlight fish	4	19
Gymnotiformes—Seahorses, pipefish	7	78
Perciformes—Perches, sea basses, cichlids	120	1,365
Pleuronectiformes—Flatfishes	2	6
Tetraodontiformes—Puffers, triggerfish	3	9
Totals	206	3,325

INVERTEBRATES

Cnidaria—Corals, anemones, jellyfish	44	2,240
Arthropoda—Lobsters, shrimps, crabs	12	60
Mollusca—Snails, bivalves, octopus	10	1,618
Echinodermata—Sea stars, sea urchins	47	497
Totals	113	4,415
Aquarium Census	351	7,887

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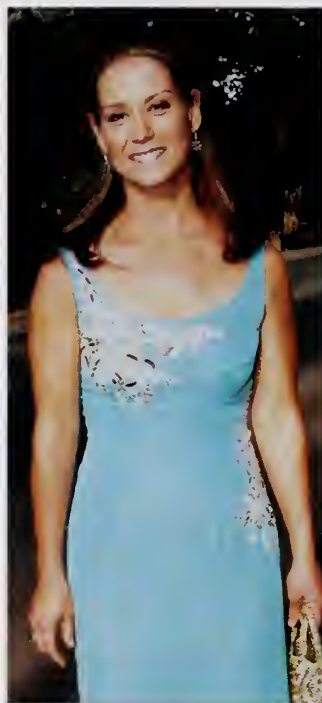
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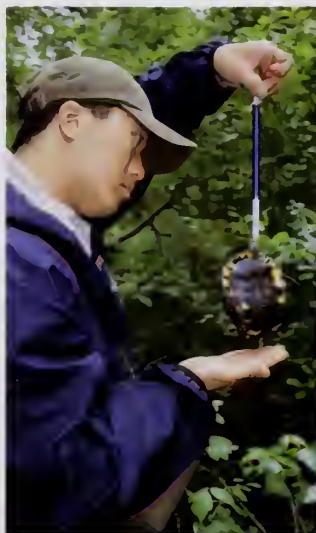
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Opposite page: Employee Recognition Day at the Bronx Zoo—25 years.
**Above: Debra Pearlman, Media Specialist. Top: Wildlife Conservation
magazine National Advertising Manager Diana Warren and Vice
President of Strategic Operations Bonnie Sevy Koeppel.**



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Opposite: Archie Carr III, WCS Regional Coordinator for Caribbean and Mesoamerica Program, and Tom Bright, Glovers Reef Field Station Manager. Above: Ellen Pikitch, Director of Marine Program.

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Above: Field scientist Steve Platt in Myanmar. Opposite: Michael Linn, Assistant Pathologist, and Bonnie Raphael, Senior Veterinarian, performing a necropsy on an Indian rhino.

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Facts and Figures

OPERATING EXPENSES

Bronx Zoo	\$34,930,000
New York Aquarium	9,578,000
Wildlife Centers	11,921,000
International Conservation	16,749,000
Wildlife Conservation Magazine	1,838,000

Total Program Expenses \$75,016,000

Visitor Services 9,347,000

Supporting Service 15,244,000

Total Wildlife Conservation Society 99,607,000

ATTENDANCE AT WCS FACILITIES

Bronx Zoo	2,425,104
Congo Gorilla Forest	858,429
JungleWorld	672,762
Children's Zoo	465,800
World of Reptiles	490,634
World of Darkness	377,351
Zoo Shuttle	297,481
Bengali Express	525,420
Skyfari	313,037

New York Aquarium 750,855

Central Park Wildlife Center 864,774

Queens Wildlife Center 206,299

Prospect Park Wildlife Center 228,156

Total WCS Attendance 4,475,188

MEMBERSHIP AND MAGAZINE

Members	106,851
Wildlife Conservation magazine	
Circulation	154,331

ANIMAL CENSUSES

Bronx Zoo	
4,166 animals of 531 species	
Children's Zoo, Bronx Zoo	
616 animals of 108 species	
New York Aquarium	
7,887 animals of 351 species	
St. Catherines Wildlife Survival Center	
434 animals of 56 species	
Central Park Wildlife Center	
1,312 animals of 140 species	
Queens Wildlife Center	
408 animals of 68 species	
Prospect Park Wildlife Center	
398 animals of 88 species	

Total WCS Census
15,221 animals of 1,342 species

BIRTHS AND HATCHINGS

Bronx Zoo	685
Bronx Zoo Children's Zoo	41
St. Catherines Wildlife	
Survival Center	54
Central Park Wildlife Center	203
Queens Wildlife Park	27
Prospect Park Wildlife Center	26

LEADERSHIP POSITIONS IN WILDLIFE CONSERVATION

WCS staff participate widely in the collaborative wildlife conservation efforts of the American Zoo and Aquarium Association (AZA), which represents accredited zoos and aquariums in North America, and the World Conservation Union (IUCN), a global network of governmental and non-governmental conservation organizations. Below are listed WCS staff who serve as officers in the work being performed by the AZA and the IUCN.

American Zoo and Aquarium Association (AZA)

President: Richard Lattis

Animal Welfare Committee: William Conway, Advisor
Acquisition and Disposition Task Force: Richard Lattis, Chairman

Finance/Investment Committee: Richard Lattis, Chairman

Nominating Committee: Richard Lattis, Chairman

Species Survival Plan (SSP) Coordinators: Babirusa,

Penny Kalk; Lowland gorilla, Dan Wharton;

Asian wild horse, Patrick Thomas; Snow leopard, Dan Wharton; Sumatran rhinoceros, James

G. Doherty; Great hornbill, Christine Sheppard;

St. Vincent's Amazon and Congo peafowl, Don

Bruning; Mauritius pink pigeon, Kurt Hundgen;

Chinese alligator, John Behler; Radiated tortoise,

William Holmstrom

North American Studbook Keepers: Lowland gorilla,

Dan Wharton; Rock hyrax, Marian Glick-Bauer;

Jackson's hartebeest, Jeff Spratt; St. Vincent's Ama-

zon, Pheasant, and Congo peafowl, Don Bruning;

Mauritius pink pigeon and Red bird of paradise,

Kurt Hundgen; Lesser bird of paradise, Patti Cooper;

Common anaconda and Radiated tortoise, Wil-

liam Holmstrom; Indian star tortoise, Christina

Castillano; Beluga whale, Louis Garibaldi.

International Studbook Keepers: Mountain peacock

pheasant, Don Bruning; Malayan peacock pheas-

ant, Don Bruning; Chinese alligator, John Behler.

Taxon Advisory Group (TAG) Chairmen or Co-

Chairmen: Cervids/Tragulids, James G. Doherty;

Coraciiformes, Christine Sheppard; Galliformes,

Don Bruning and Christine Sheppard; Parrots,

Don Bruning; Freshwater fishes, Paul Loiselle

Scientific Advisory Group (SAG): Systematics, George

Amato

AZA Nutritional Advisory Group. Executive Com-

mittee: Ellen Dierenfeld



Above: Bronx Zoo Primary Wild Animal Keeper Chris Wilgenkamp works with a Siberian tiger during operant conditioning. Opposite, below: Staff photographer Dennis DeMello on assignment. Opposite, top: A landscape species, the tiger is a focus of the Global Carnivore Program.



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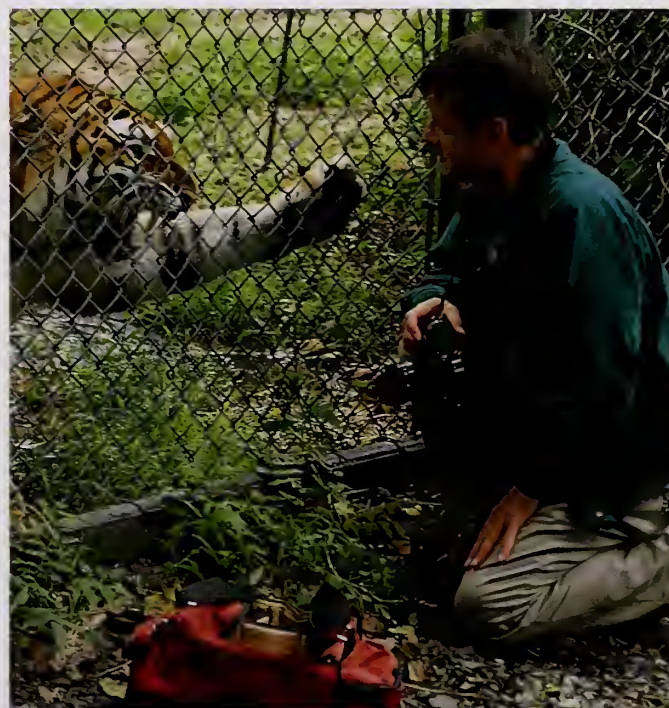
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The Trustees of the Wildlife Conservation Society recommend that for estate planning purposes, members and friends consider the following language for use in their wills: "To the Wildlife Conservation Society, a not-for-profit, tax-exempt organization incorporated in the State of New York in 1895, having as its principal address the Wildlife Conservation Society, 2300 Southern Boulevard, Bronx, New York 10460, I hereby give and bequeath _____ for the Society's general purposes."

In order to help WCS avoid future administration costs, it is suggested that the following paragraph be added to any restrictions that are imposed on a bequest: "If at some future time, in the judgment of the Trustees of the Wildlife Conservation Society, it is no longer practical to use the income or principal of this bequest for the purposes intended, the Trustees have the right to use the income or principal for whatever purposes they deem necessary and most closely in accord with the intent described herein."

If you wish to discuss the language of your bequest with a member of the WCS staff, please be in touch with the Planned Giving Office at 718-220-5090.

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WILDLIFE CONSERVATION SOCIETY

Bronx Zoo ♦ 2300 Southern Boulevard ♦ Bronx, New York 10460

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